

# Service Manual

ORDER NO.  
**ARP2021**

FM/AM DIGITAL SYNTHESIZER TUNER

# F-656MARKII

HE, HEWZ

# F-656MARKII-S

HEWZ

MODEL F-656MARKII AND F-656MARKII-S HAVE FOLLOWING VERSIONS:

Type	Applicable model		Power requirement	Export destination
	F-656MARKII	F-656MARKII-S		
HE	○	×	AC220V, 240V(switchable)*	European continent
HEWZ	○	○	AC220V, 240V(switchable)*	West Germany
HIX1B	○	×	AC220V, 240V(switchable)*	Italy

\* Change the primary wiring of the power transformer.

## ● Refer to the service manual ARP1812, F-656/KUC.

- This manual is applicable to the F-656MARKII/HEWZ, HE and F-656MARKII-S/HEWZ types.
- The F-656MARKII-S is the same as the F-656MARKII except for color.
- F-656MARKII is an improved model of F-656 in which the following points have been changed.
- The number of channel calls of the microcomputer has been changed from 24 stations to 36 stations.
- The front panel and the external appearance have been slightly changed.

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# 1. CONTRAST OF MISCELLANEOUS PARTS

## NOTES:

- Parts without part number cannot be supplied.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The F-656MARKII/HEWZ, HE and F-656MARKII-S/HEWZ types are the same as the F-656/KUC type with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		F-656/KUC	F-656MARKII/HEWZ	F-656MARKII/HE	F-656MARKII-S/HEWZ	
	Tuner assembly	AWZ2416	AWZ2981	AWZ2980	AWZ2981	
$\Delta$	AC power cord	ADG-088	ADG1010	ADG1021	ADG1010	
$\Delta$	Fuse (FU101, 500mA/125V)	AEK-136	AEK-407	AEK-407	AEK-504	
$\Delta$	Fuse (FU101, T315mA/250V)	...	AEK1033	AEK1033	AEK1033	
	Panel base	AMB1464	AMB1626	AMB1626	AMB1627	
	Bonnet case	AZN1745	AZN1745	AZN1745	AZN1803	
	Station call knob	AAD1549	AAD1751	AAD1751	AAD1753	
	Station call knob	AAD1550	AAD1752	AAD1752	AAD1754	
	Acrylic panel	AAK1717	AAK1685	AAK1685	AAK1685	
	FL filter	AAK1786	AAK1785	AAK1785	AAK1785	
	Insulator assembly	AMR1434	...	...	...	
	Insulator assembly	AMR1435	...	...	...	
	Insulator assembly	...	AMR2140	AMR2140	AMR2140	
	Cord with plug	ADE-085	...	...	...	
	Front panel	ANB1275	ANB1375	ANB1375	ANB1376	
	Screw	...	...	...	ABA-274	
	Screw	BBT30P060FZK	BBT30P060FZK	BBT30P060FZK	...	
	Screw	...	ABA1009	ABA1009	ABA1009	
	Packing case	AHD1608	AHD1812	AHD1812	AHD1813	
	FM antenna assembly	ADH1007	ADH1002	ADH1002	ADH1002	
	Operating instructions (German)	...	ARC1183	...	ARC1183	
	Operating instructions (English)	ARB1168	...	...	...	
	Operating instructions (English/French/German/Italian/Dutch/Swedish/Spanish/Portuguese)	...	...	ARE1147	...	

## TUNER Assembly (AWZ2980)

The Tuner assembly (AWZ2980) of F-656MARKII/HE is the microcomputer (IC701; PA5107) of the F-656/HE Tuner assembly (AWZ2415) which has been converted to PD5133. In regard to other electrical parts list, circuit diagram and the P.C.B. besides those of the microcomputers, please refer to the information of F-656/HE in service manual F-656/KUC (ARP1812).

## TUNER Assembly (AWZ2981)

The Tuner assembly (AWZ2981) of the F-656MARKII/HEWZ, F-656MARKII-S/HEWZ are the microcomputer (IC701; PA5107) of the F-656/HEZ, F-656-S/HEZ Tuner assemblies (AWZ2414) which have been converted to PD5133. In regard to other electrical parts list, circuit diagram and the P.C.B. besides those of the microcomputer, please refer to the information of F-656/HEZ, F-656-S/HEZ in service manual F-656/KUC (ARP1812).

## 2.IC INFORMATION

### PD5133 (TUNER CONTROL MICROCOMPUTER)

The number of station calls of the F-656 microcomputer (PD5107) has been changed from 24 to 36 for PA5133. In regard to what is written below, please refer to the information of PD5107 in service manual F-656/KUC (ARP1812).

#### Key input, remote control input function table.

Main unit key	Remote control key	SR code	Function
ST 1	ST 1	A4 01	When pressing once, each of ST1 — 12 (external ST) will be called, and when pressing once more within 2 seconds, each of ST13 — 24 (internal ST) will be called. Further, when pressing once more within 2 seconds, each of ST25 — 36 (rear ST) will be called. And at each time, the external ST, internal ST and the rear ST will be indicated. If the key is not pressed after this, CCTS operation will be preformed (when CCTS is ON) and the MUTE time when CCTS is OFF is approximately 1 second.
ST 2	ST 2	A4 02	
ST 3	ST 3	A4 03	
ST 4	ST 4	A4 04	
ST 5	ST 5	A4 05	
ST 6	ST 6	A4 06	
ST 7	ST 7	A4 07	
ST 8	ST 8	A4 08	
ST 9	ST 9	A4 09	
ST 10	ST 10	A4 10	
ST 11	ST 11	A4 11	
ST 12	ST 12	A4 12	
POWER	POWER	A4 1C	Power supply goes ON or OFF each time this is pressed. LED lights when power supply in ON.

### Test mode

The data below is loaded when P05 = L.

ST	9 k step	10 k step	ST	9 k step	10 k step
1	FM 87.50 M	FM 87.5 M	7	FM 108.00 M	FM 108.0 M
2	FM 89.00 M	FM 89.0 M	8	AM 531 k	AM 530 k
3	FM 90.00 M	FM 90.0 M	9	AM 603 k	AM 600 k
4	FM 99.00 M	FM 99.0 M	10	AM 1008 k	AM 1000 k
5	FM 106.00 M	FM 106.0 M	11	AM 1395 k	AM 1400 k
6	FM 107.00 M	FM 107.0 M	12	AM 1602 k	AM 1700 k

ST13 — 24

: 9k step AM 1602k  
: 10k step AM 1700k

ST25 — 36

: 9k step AM1602k  
: 10k step AM1700k

IF Band is normal, MPX is Auto.

### Switching

	14Pin	16Pin
Japan	H	H
Ex 9k/50k	H	L
Ex 10k/100k	L	L





# Service Manual

## Original


**ORDER NO.**  
**ARP 1812**
**FM/AM DIGITAL SYNTHESIZER TUNER**

# F-656

# F-656-S

**F-656 AND F-656-S HAVE FOLLOWING VERSIONS:**

Type	Applicable model		Power requirement	Destination
	F-656	F-656-S		
KUC	○	—	AC120V only	U. S. A. and Canada
HE	○	—	AC220V, 240V (switchable)*	European continent
HB	○	—	AC220V, 240V (switchable)*	United Kingdom
HEZ	○	○	AC220V, 240V (switchable)*	West Germany
HIX1B	○	—	AC220V, 240V (switchable)*	Italy

\*Change the connection of the TUNER ASSEMBLY primary pins.

- This manual is applicable to the KUC, HE, HB, HEZ and HIX1B types.
- For the F-656/HE, HB, HEZ, HIX1B and F-656-S/HEZ types, refer to page 25 — 27.
- The F-656-S is the same as the F-656 except for color.
- Ce manuel pour le service comprend les explications en français de réglage.
- Este manual de servicio trata del método ajuste escrito en español.

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# 1. SAFETY INFORMATION

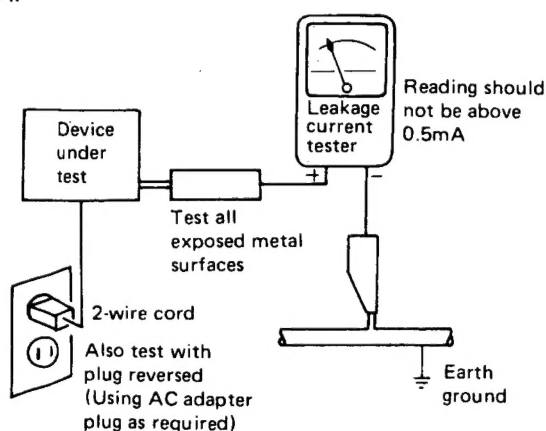
(FOR USA MODEL ONLY)

## 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

### LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

## 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

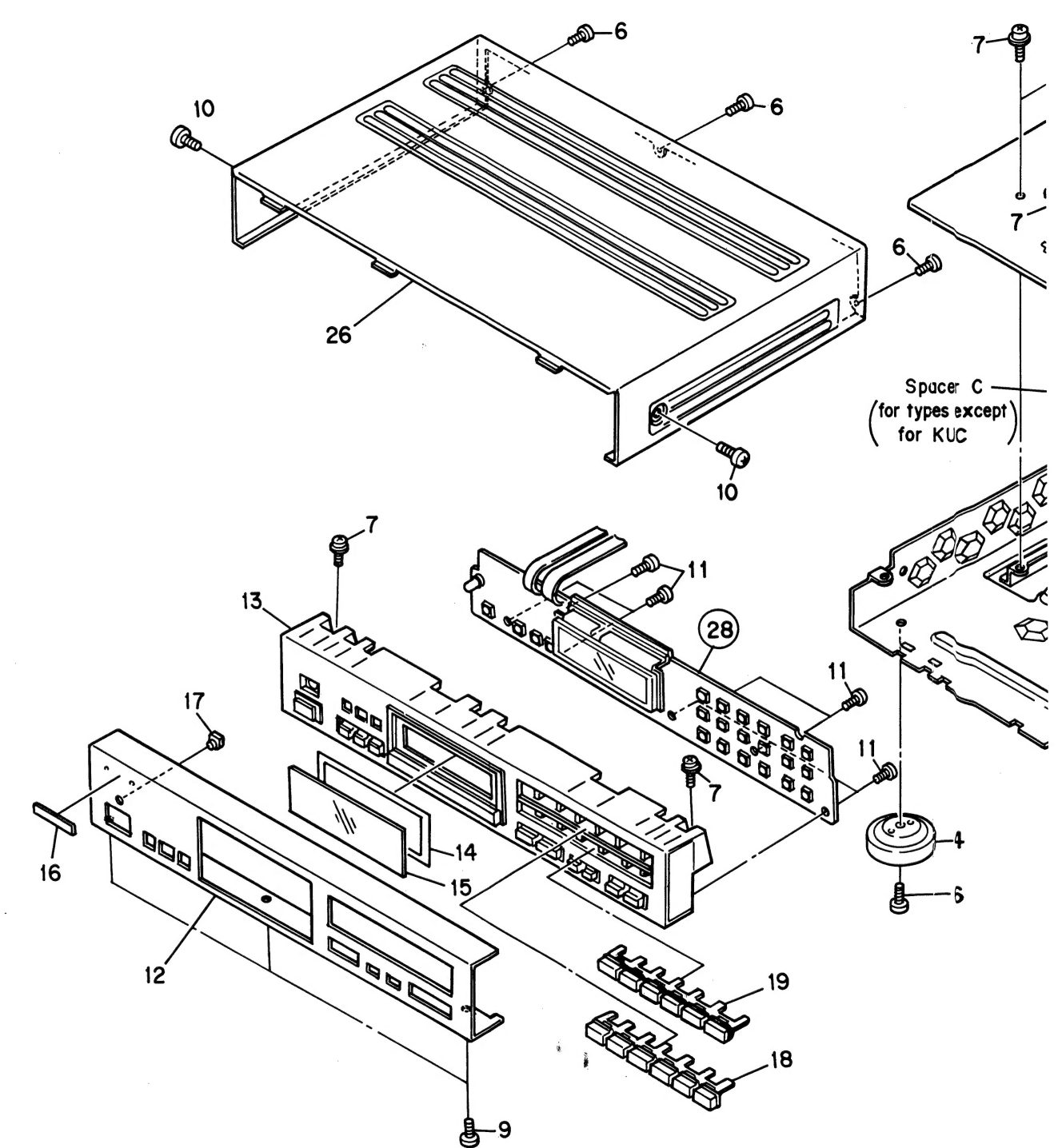
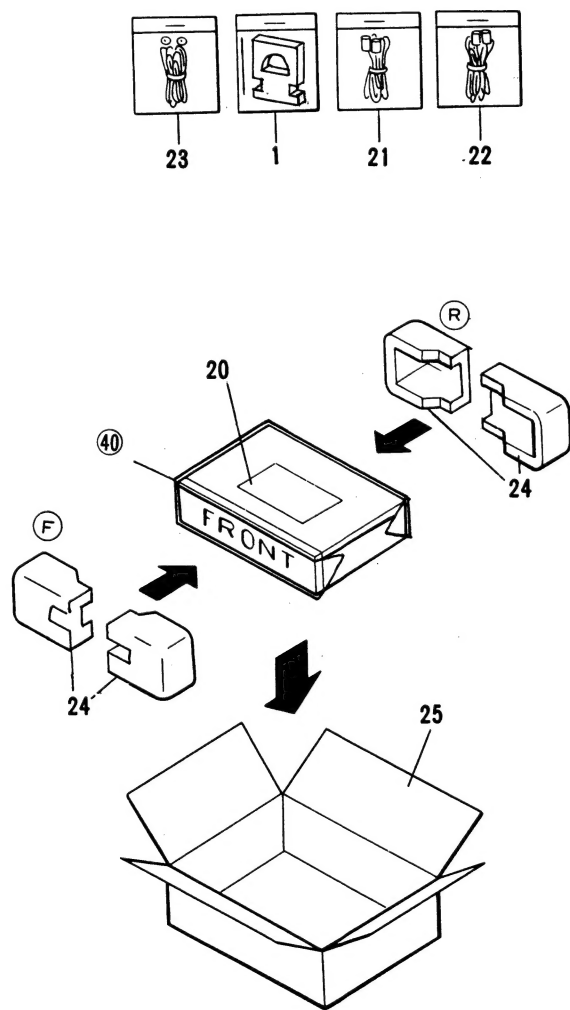
The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

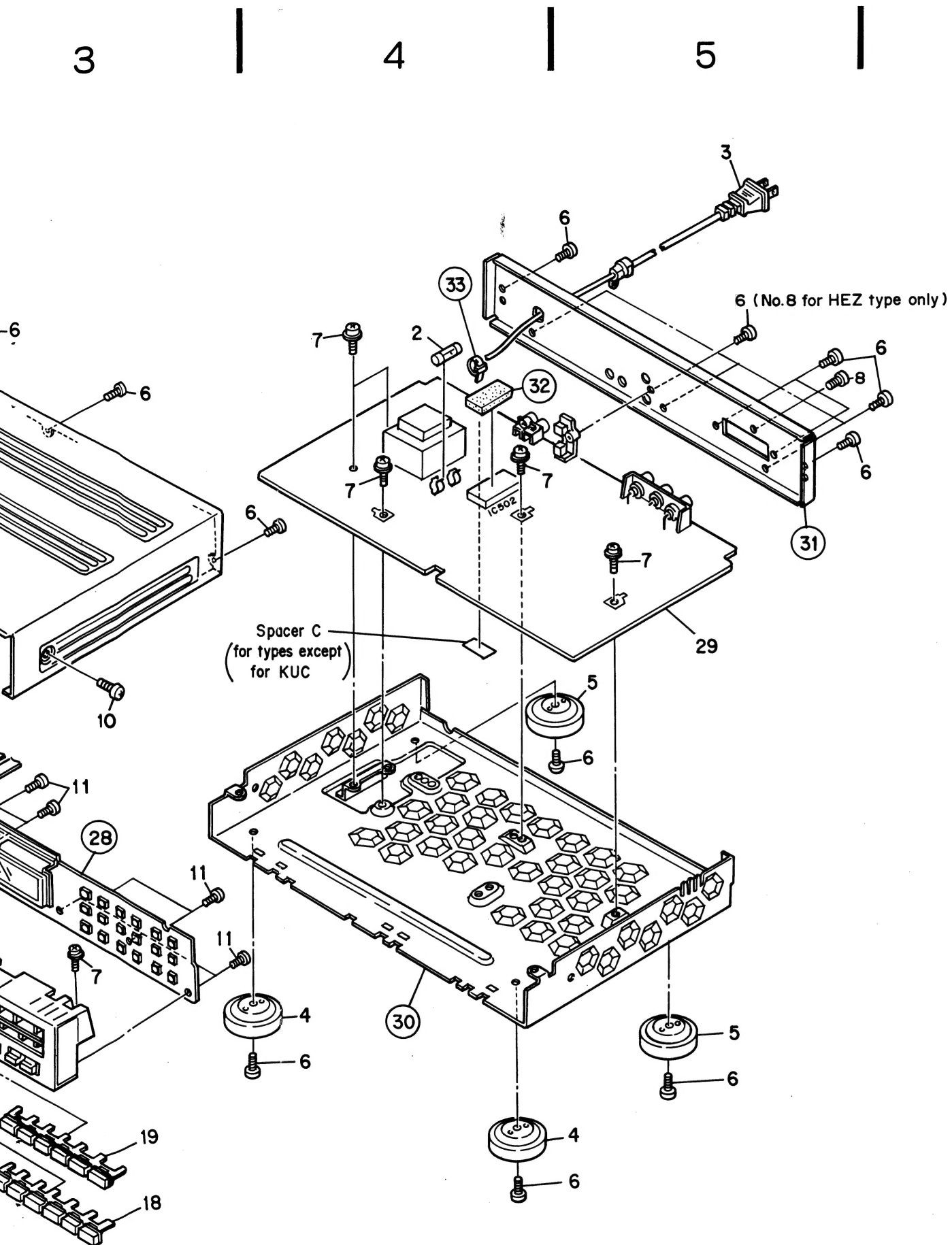
2. EXPLODED VIEWS, PACKING AND PARTS LIST

- NOTES:
- Parts without part number cannot be supplied.
  - The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
  - Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Mark	No.	Part No.	Description
	1	ATB-086	BAR ANTENNA
	2	AEK-136	FUSE (500mA), FU101
	3	ADG-088	AC POWER CORD
	4	AMR1434	INSULATOR ASSEMBLY
	5	AMR1435	INSULATOR ASSEMBLY
	6	ABA-298	SCREW
	7	ABA1011	SCREW (STEEL)
	8	ABA1047	SCREW (STEEL)
	9	ABA1048	SCREW (STEEL)
	10	BBT30P060FZK	SCREW
	11	BPZ26P080FMC	SCREW
	12	ANB1275	FRONT PANEL
	13	AMB1464	PANEL BASE
	14	AAK1687	FL FILTER
	15	AAK1717	ACRYL PANEL
	16	AAM1029	NAME PLATE (METAL)
	17	AMR1160	INDICATING LENS
	18	AAD1549	STATION CALL KNOB
	19	AAD1550	STATION CALL KNOB
	20	ARB1168	OPERATING INSTRUCTIONS
	21	ADE-081	PULG CORD
	22	ADE-085	CORD WITH PLUG
	23	ADH1007	FM ANTENNA
	24	AHA1095	FRONT REAR PAD
	25	AHD1608	PACKING CASE
	26	AZN1745	BONNET
	27		DISPLAY ASSEMBLY
	28		TUNER ASSEMBLY
	29	AWZ2416	CHASSIS ASSEMBLY
	30		
	31		REAR PANEL
	32		CU PLATE
	33		NYLON BINDER
	34		
	35		
	36		
	37		
	38		
	39		
	40		SHEET







A

B

C

D





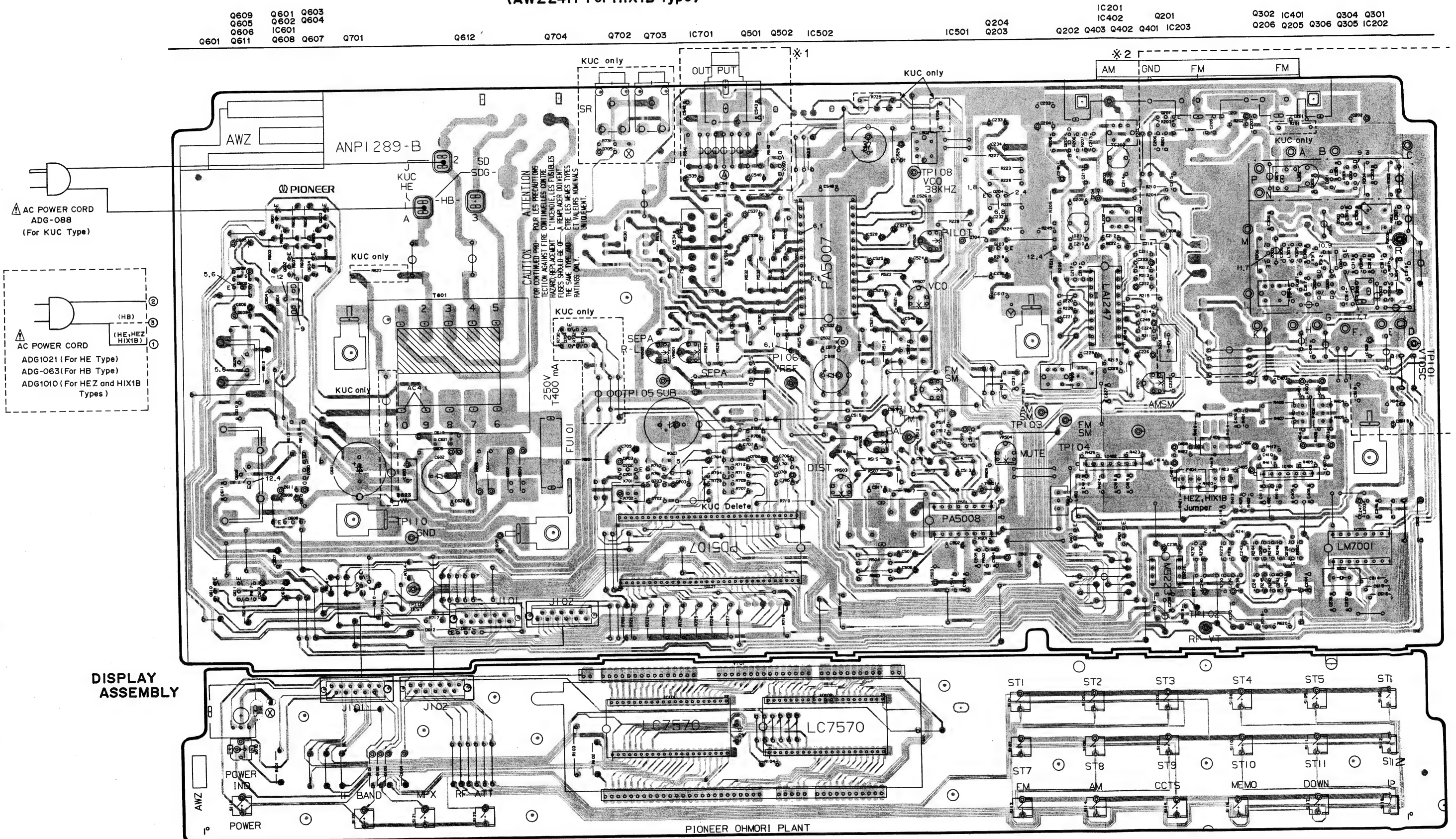


D



#### 4. P.C. BOARDS CONNECTION DIAGRAM

**TUNER ASSEMBLY (AWZ2416 For KUC type) (AWZ2414 For HEZ type)**  
**(AWZ2415 For HE,HB types)**  
**(AWZ2417 For HIX1B type)**

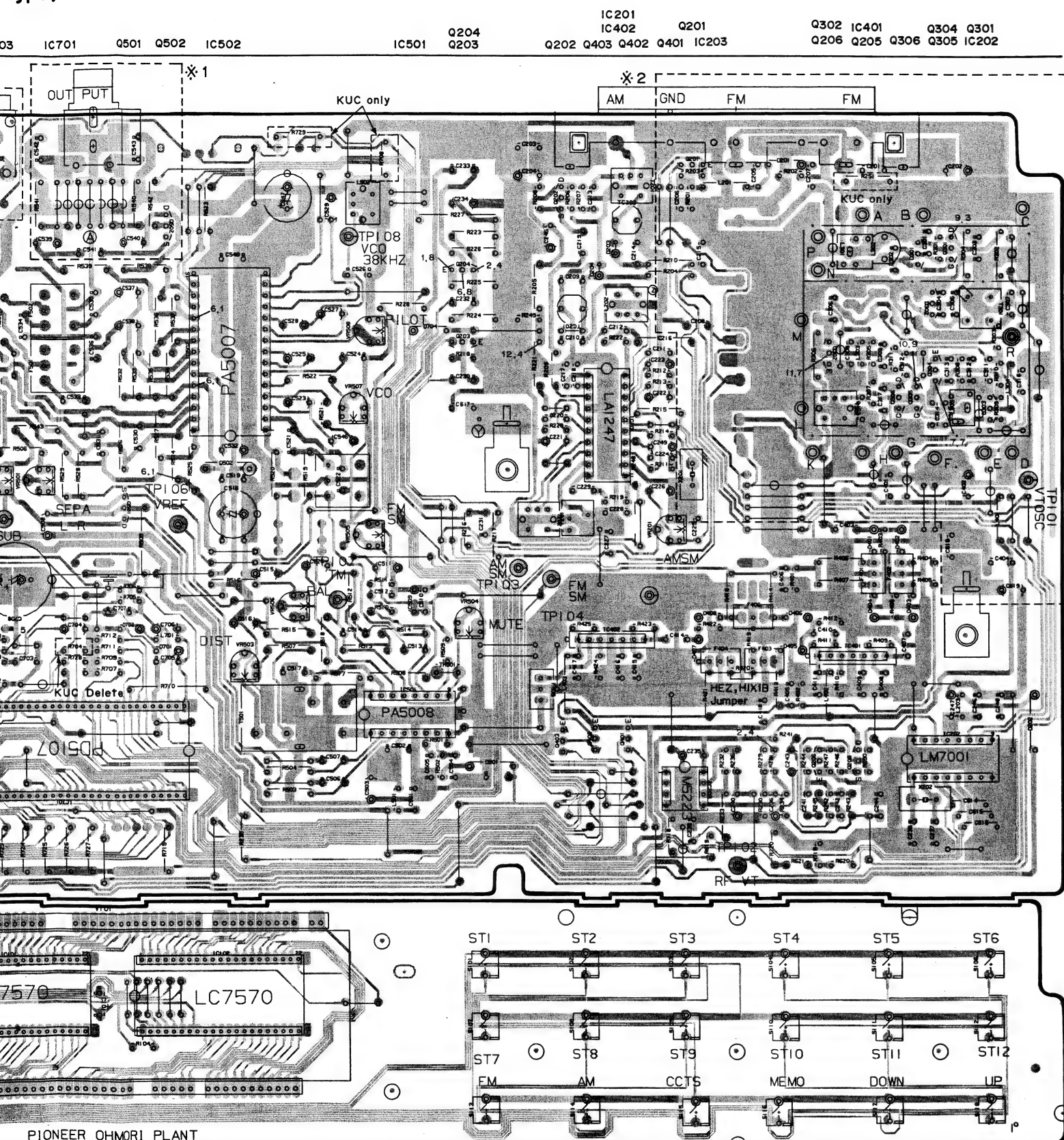


## DISPLAY ASSEMBLY

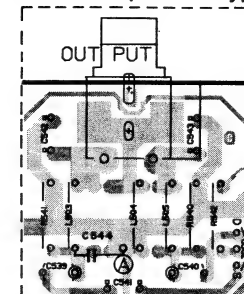
PIONEER OHMORI PLANT



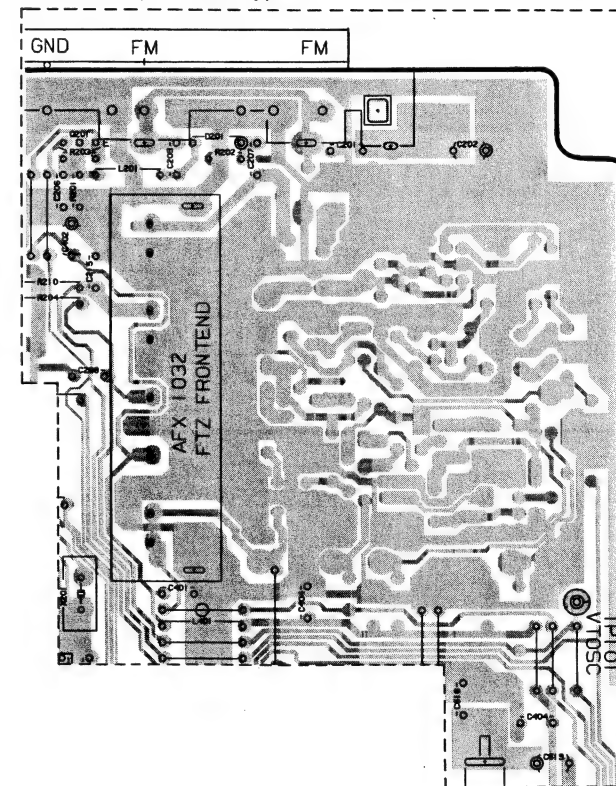
pe)  
3 types)  
type)



※1 HEZ, HIX1B Types



※2 HEZ, HIX1B Types



# NOTE

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
		Transistor
		Radiator type transistor
		Diode
		Resistor
		Capacitor (Polarity)
		Capacitor (Non-polarity)

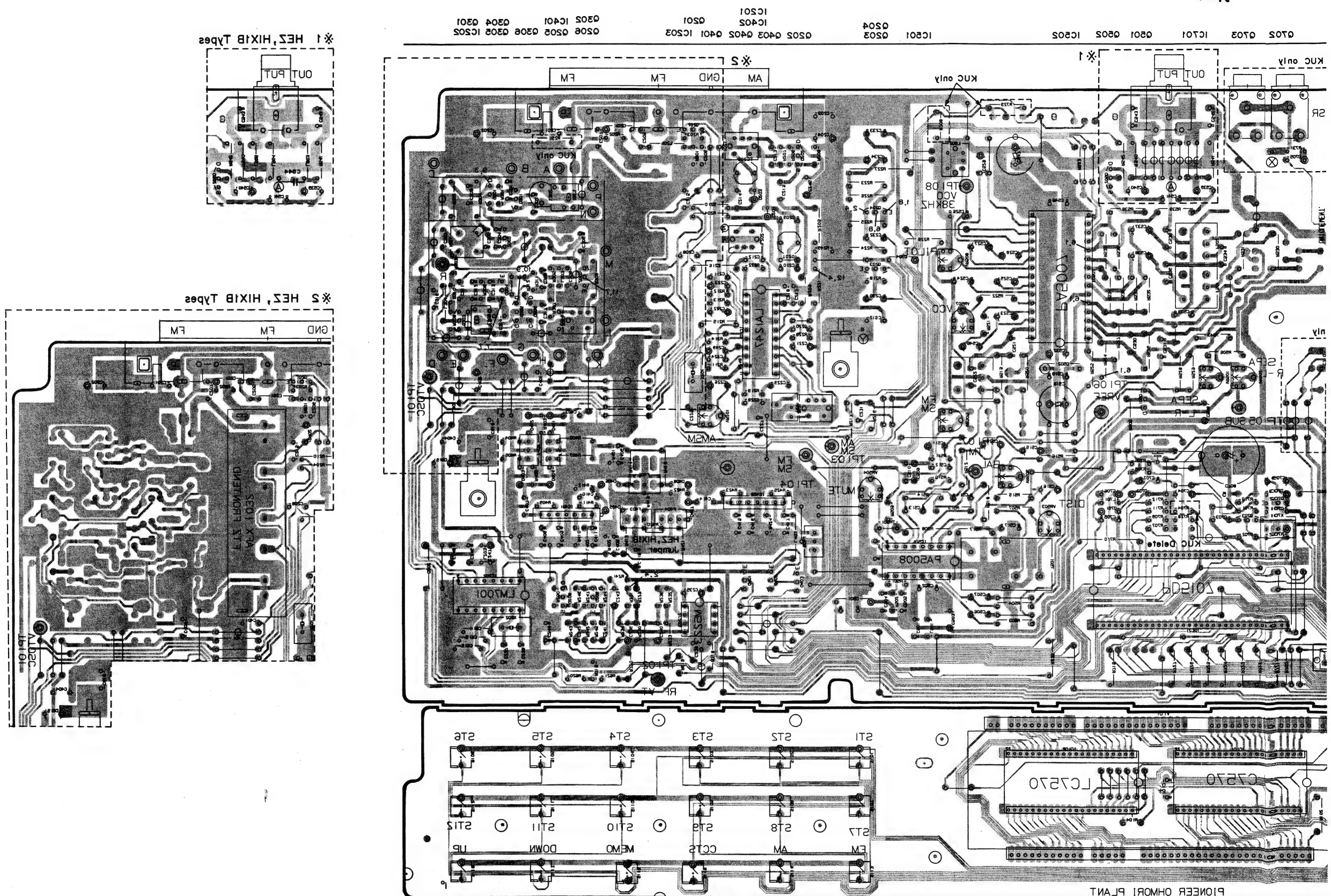
3. The capacitor terminal marked with ⊙ (double circles) shows negative terminal.
4. The diode terminal marked with ⊙ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

# Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor



For HIX1B type)  
For HE, HB types)  
For HEZ type)

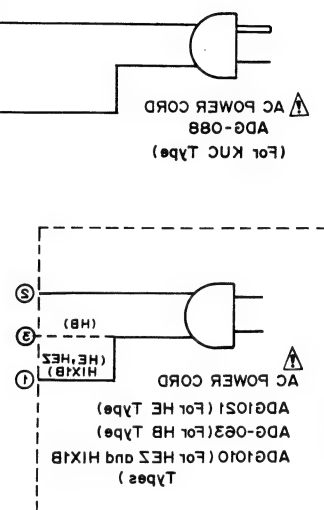
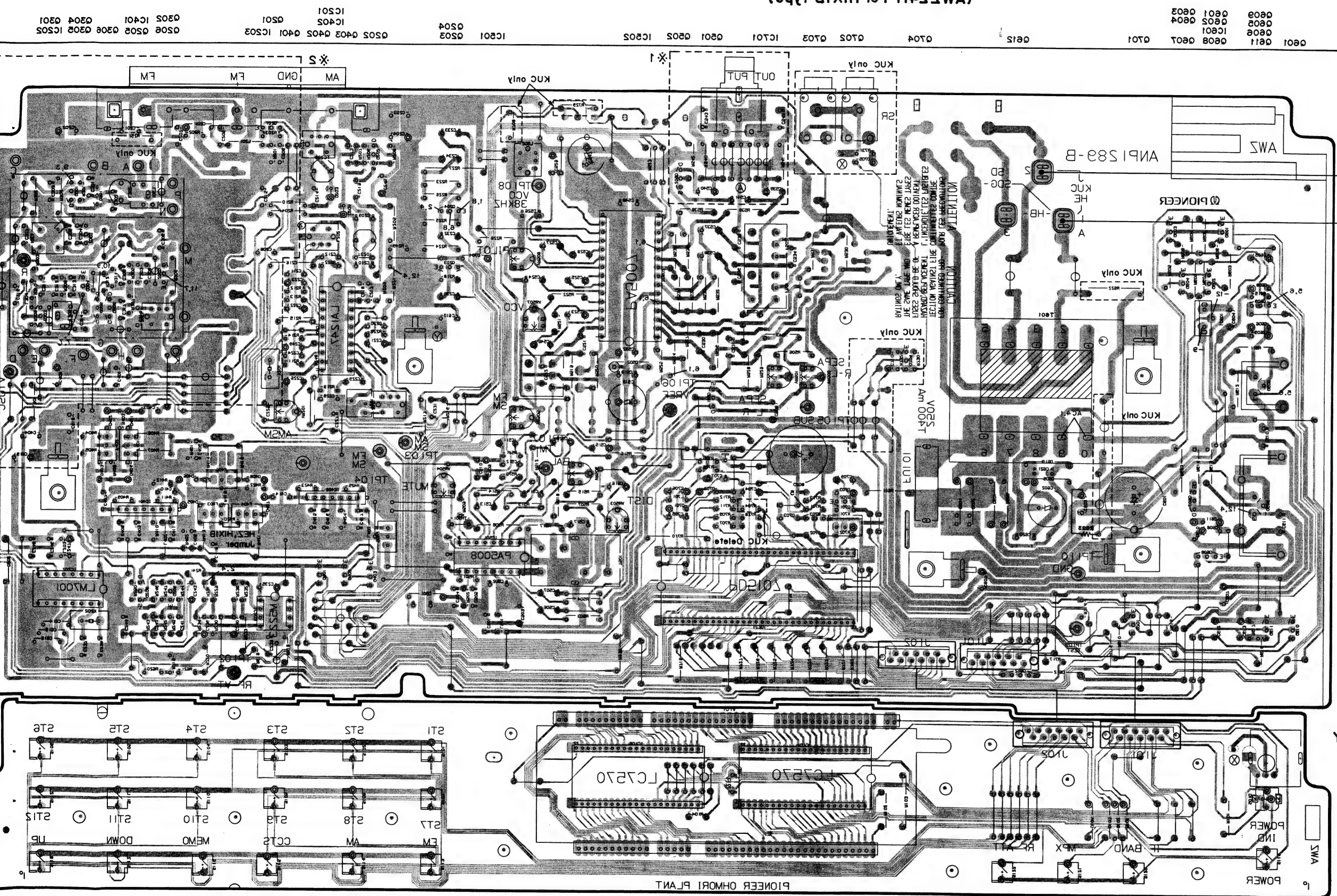




#### 4. P.C. BOARDS CONNECTION DIAGRAM

**This P.C.B. connection diagram is viewed from the foil side.**

TUNER ASSEMBLY (AWS416 For KUC type) (AWS414 For HEZ type)  
(AWS415 For HE, HB types)  
(AWS417 For HIX1B type)



ASSEMBLY  
DISPLAY

## 5. ADJUSTMENTS

### FM SECTION

- For connections and points to be adjusted, refer to Fig. 5-1 and Fig. 5-2.
- Set the function selector to "FM".
- Set the "IF BAND" and "CCTS" switches on the front panel to "OFF".

Step No.	FM SG (1 kHz $\pm$ 75 kHz dev.)		F-656 type (F-656-S) Reception frequency display	Adjustment	
	Frequency (MHz)	Level (dB $\mu$ )		Adjustment location	Specifications
1	—	—	87.5 MHz	—	Confirm that the DC voltage between TP101 (VT OSC) and TP110 (GND) is 3.4 V $\pm$ 2.0 V.
2	—	—	108.0 MHz	—	Confirm that the DC voltage between TP101 (VT OSC) and TP110 (GND) is 8.7 V $\pm$ 2.0 V.
3 (*1)	IF BAND SW = NORMAL, CCTS SW = OFF				
	98.0	20 – 30	98.0 MHz	L302, T301, T302	Adjust that the DC voltage between TP104 (FM SM) and TP110 (GND) is maximum.
4	IF BAND SW = NORMAL, CCTS SW = OFF				
	98.0	80	98.0 MHz	T501-(A)	Adjust that the DC voltage between TP106 (VREF) and TP107 (TM) is 0 V $\pm$ 100 mV.
				T501-(B) VR503	Adjust so that the mono distortion of the output is at minimum.
Repeat steps 4— ① and 4— ② until both specification ratings are satisfied.					
5	98.0	60	98.0 MHz	VR506	Adjust so that the waveform of TP105 (SUB) is at minimum.
6	98.0	60	98.0 MHz	VR508	Adjust so that the pilot cancel volume of the output is maximum.
7	98.0	60 (No modulation)	98.0 MHz	VR507	Adjust that the frequency between TP108 (VCO 38 kHz) and TP110 (GND) is 38 kHz $\pm$ 100 Hz. (*2)
8	Adjust so that IF BAND SW = NORMAL, CCTS SW = OFF, T302 is within $\pm$ 90°.				
	98.0	80 (*3)	98.0 MHz	VR503, T302 (*4)	Adjust so that the stereo distortion of the output is at minimum.
9	98.0	60	98.0 MHz	VR501, VR502	Adjust so that the separation of the output is at minimum.
10	IF BAND SW = NORMAL, CCTS SW = OFF				
	98.0	90	98.0 MHz	VR505	Adjust that the DC voltage between TP104 (FM SM) and TP110 (GND) is 4.9 V $\pm$ 0.2 V.
11	IF BAND SW = NORMAL, CCTS SW = OFF				
	98.0	—	98.0 MHz	VR504	Adjust so that there is muting when the output is 15 dB $\pm$ 4dB.

(\*1) This adjustment is only with types HE, HB, KUC.

(\*2) Wait at least one minute after turning the Power SW on before carrying out adjustments.

(\*3) Stereo modulation: Main 1 kHz, L+R  $\pm$  68.25 kHz, Pilot 19 kHz  $\pm$  6.75 kHz.

(\*4) T302 is only on types HE, HB and KUC. If stereo distortion does not improve on HEZ and HIX1B, adjust the IFT coil (Fig. 5-2) in the front end to within  $\pm$  90°.

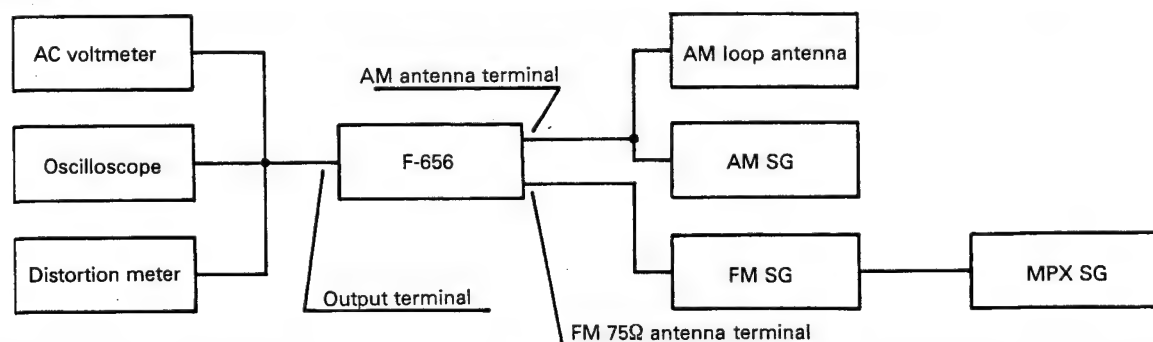


Fig. 5-1

## AM SECTION

- For connections and points to be adjusted, refer to Fig. 5-1 and Fig. 5-2.
- Set the function selector to "AM".

Step No.	AM SG (400 Hz, 30% modulation)		F-656 type (F-656-S) Reception frequency display	Adjustment	
	Frequency (kHz)	Level (dB $\mu$ )		Adjustment location	Specifications
1	—	—	522 kHz (530 kHz)	TC201	Adjust that the DC voltage between TP101 (VTOSC) and TP110 (GND) is $1.25 \text{ V} \pm 0.2 \text{ V}$ .
2	—	—	1629 kHz (1700 kHz)	L202	Adjust that the DC voltage between TP101 (VTOSC) and TP110 (GND) is $10.0 \text{ V} \pm 0.3 \text{ V}$ .
3	Repeat steps 1 and 2 until both specification ratings are satisfied.				
4	603 (600)	20 — 30	603 kHz (600 kHz)	T201	Adjust that the DC voltage between TP103 (AM SM) and TP110 (GND) is maximum.
5	1395 (1400)	20 — 30	1395 kHz (1400 kHz)	TC202	Adjust that the DC voltage between TP103 (AM SM) and TP110 (GND) is maximum.
6	Repeat steps 4 and 5 until both specification ratings are satisfied.				
7	999 (1000)	20 — 30	999 kHz (1000 kHz)	T202	Adjust that the DC voltage between TP103 (AM SM) and TP110 (GND) is maximum.
8	CCTS SW — OFF				
	999 (1000)	100	999 kHz (1000 kHz)	VR201	Adjust that the DC voltage between TP103 (AM SM) and TP110 (GND) is $4.9 \text{ V} \pm 0.2 \text{ V}$ .

NOTE: Those sections in parentheses show the frequency with KUC type (10 kHz Step).

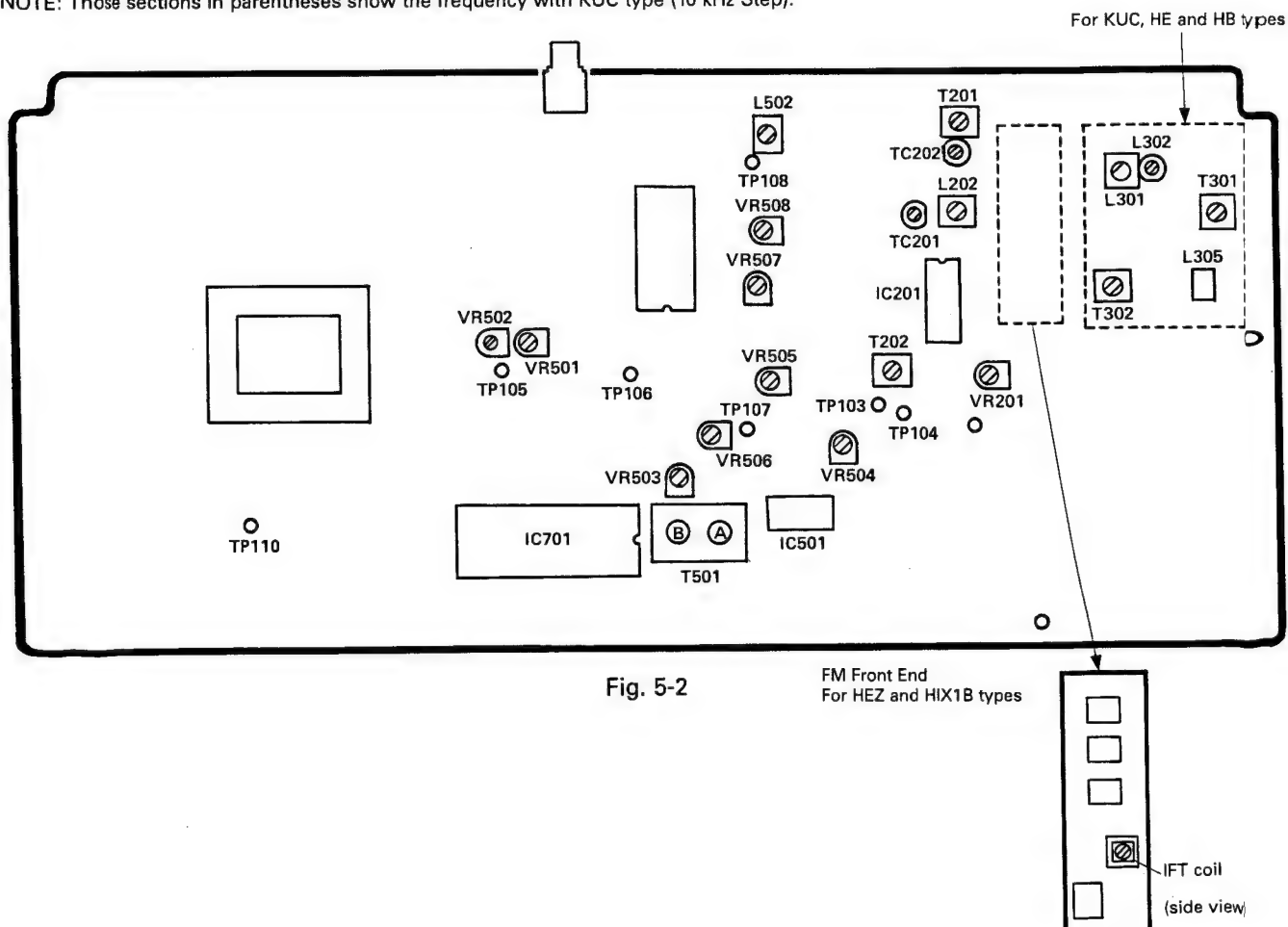


Fig. 5-2

FM Front End  
For HEZ and HIX1B types

## 5. RÉGLAGE

### SECTION FM

- Pour les connexions et les points à régler, se reporter à la Fig. 5-1 et Fig. 5-2.
- Mettre le sélecteur fonction sur "FM".
- Mettre les sélecteurs "IF BAND" et "CCTS" du panneau frontal sur "OFF".

N° d'étape	Signal FM (1 kHz $\pm$ 75 kHz dév.)		Type (F-656-S) Affichage de réception de la fréquence	Réglage	
	Fréquence (MHz)	Niveau (dB $\mu$ )		Emplacement de l'ajustement	Spécifications
1	—	—	87,5 MHz	—	Confirmer que la tension CC entre TP101 (VT OSC) et TP110 (GND) est de 3,4 V $\pm$ 2,0 V.
2	—	—	108,0 MHz	—	Confirmer que la tension CC entre TP101 (VT OSC) et TP110 (GND) est de 8,7 V $\pm$ 2,0 V.
3 (*1)	Sélecteur IF BAND = NORMAL, sélecteur CCTS = OFF				
	98,0	20 – 30	98,0 MHz	L302, T301, T302	Régler la tension CC entre TP104 (FM SM) et TP110 (GND) pour qu'elle soit maximum.
4	Sélecteur IF BAND = NOMAL, sélecteur CCTS = OFF				
	98,0	80	98,0 MHz	T501-(A)	Régler la tension CC entre TP106 (VREF) et TP107 (TM) pour qu'elle soit de 0 V $\pm$ 100 mV.
				T501-(B) VR503	Régler pour que la distorsion mono de la sortie soit au minimum.
	Répéter les étapes 4— ① et 4— ② jusqu'à ce que les deux rapports de spécification soient satisfaits.				
5	98,0	60	98,0 MHz	VR506	Régler de façon à ce que la forme d'onde de TP105 (SUB) soit au minimum.
6	98,0	60	98,0 MHz	VR508	Régler de façon à ce que le volume d'annulation pilote soit au maximum.
7	98,0	60 (pas de modulation)	98,0 MHz	VR507	Régler de façon à ce que la fréquence entre TP108 (VCO 38 kHz) et TP110 (GND) soit de 38 kHz $\pm$ 100 Hz. (*2).
8	Régler pour que le sélecteur IF BAND = NORMAL, le sélecteur CCTS = OFF, T302 soit $\pm$ 90°.				
	98,0	80 (*3)	98,0 MHz	VR503, T302 (*4)	Régler de façon à ce que la distorsion stéréo de la sortie soit minimum.
9	98,0	60	98,0 MHz	VR501, VR502	Régler de façon à ce que la séparation de la sortie soit minimum.
10	Sélecteur IF BAND = NORMAL, sélecteur CCTS = OFF				
	98,0	90	98,0 MHz	VR505	Régler de façon à ce que la tension CC entre TP104 (FM SM) et TP (110) soit 4,9 V $\pm$ 0,2 V.
11	Sélecteur IF BAND = NORMAL, sélecteur CCTS = OFF				
	98,0	—	98,0 MHz	VR504	Régler de façon à ce qu'il y ait un assourdissement lorsque la sortie est de 15 dB $\pm$ 4 dB.

(\*1) Cet ajustement n'est valable que pour les types HE, HB, KUC.

(\*2) Attendre au moins une minute après avoir mis le sélecteur d'alimentation en action avant d'effectuer ces ajustements.

(\*3) Modulation stéréo: Principal 1 kHz, L + R  $\pm$  68,25 kHz, Pilote 19 kHz  $\pm$  6,75 kHz.

(\*4) T302 n'est valable que pour les types HE, HB et KUC. Si la distorsion stéréo ne s'améliore pas sur HEZ et HIX1B, ajuster la bobine IFT (Fig. 5-2) sur l'extrémité avant entre  $\pm$  90°.

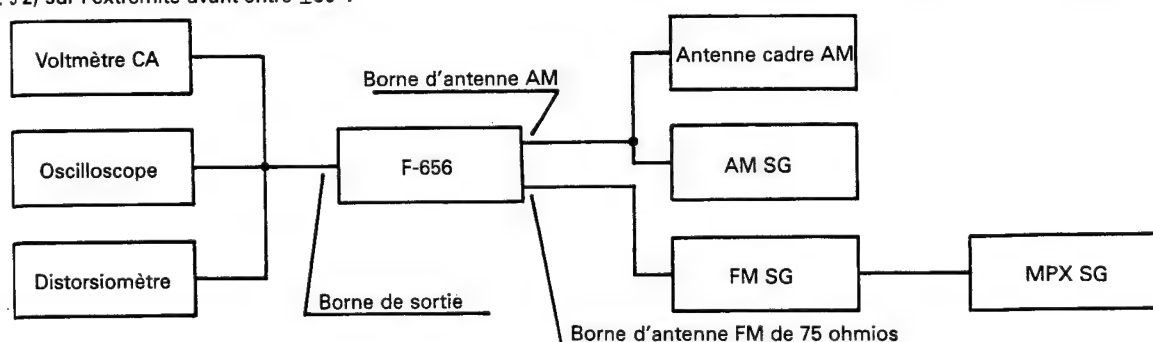


Fig. 5-1

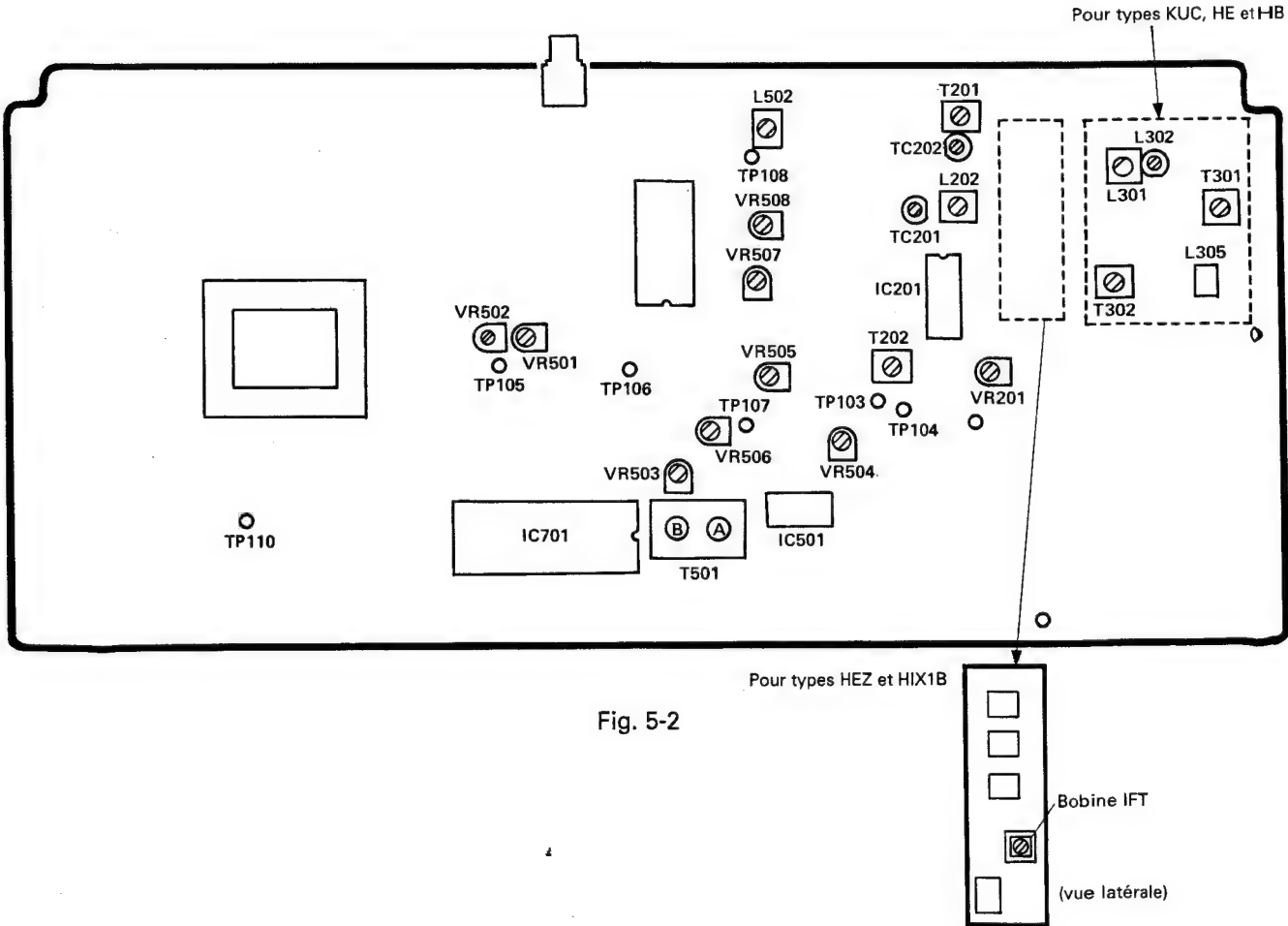


SECTION AM

- Pour les connexions et les points à régler, se reporter à la Fig. 5-1 et Fig. 5-2.
- Mettre le sélecteur fonction sur "AM".

N° d'étape	Signal AM (400 Hz, 30% modulation)		Type (F-656-S) Affichage de réception de la fréquence	Réglage	
	Fréquence (kHz)	Niveau (dB $\mu$ )		Emplacement de l'ajustement	Spécifications
1	—	—	522 kHz (530 kHz)	TC201	Régler de façon à ce que la tension CC entre TP101 (VTOSC) et TP110 (GND) soit de 1,25 V $\pm$ 0,2 V.
2	—	—	1629 kHz (1700 kHz)	L202	Régler de façon à ce que la tension CC entre TP101 (VTOSC) et TP110 (GND) soit de 10,0 V $\pm$ 0,3 V.
3	Répéter les étapes 1 et 2 jusqu'à ce que les deux rapports de spécification soient satisfaits.				
4	603 (600)	20 — 30	603 kHz (600 kHz)	T201	Régler de façon à ce que la tension CC entre TP103 (AM SM) et TP110 (GND) soit maximum.
5	1395 (1400)	20 — 30	1395 kHz (1400 kHz)	TC202	Régler de façon à ce que la tension CC entre TP103 (AM SM) et TP110 (GND) soit maximum.
6	Répéter les étapes 4 et 5 jusqu'à ce que les deux rapports de spécification soient satisfaits.				
7	999 (1000)	20 — 30	999 kHz (1000 kHz)	T202	Régler de façon à ce que la tension CC entre TP103 (AM SM) et TP110 (GND) soit maximum.
8	Sélecteur CCTS = OFF				
	999 (1000)	100	999 kHz (1000 kHz)	VR201	Régler de façon à ce que la tension CC entre TP103 (AM SM) et TP110 (GND) soit de 4,9 V $\pm$ 0,2 V.

REMARQUE: Les sections entre parenthèses montrent la fréquence avec le type KUC (pas de 10 kHz).





## 5. AJUSTE

### SECCIÓN DE FM

- Con respecto a las conexiones y puntos de ajuste, consulte la Fig. 5-1 y Fig. 5-2.
- Ponga el selector función en "FM".
- Ponga los interruptores "IF BAND" y "CCTS" del panel frontal en "OFF".

No. de paso	FM SG (1 kHz $\pm$ 75 kHz dev.)		Tipo F-656 (F-656-S)	Ajuste	
	Frecuencia (MHz)	Nivel (dB $\mu$ )	Visualización de la frecuencia de recepción	Lugar de ajuste	Especificaciones
1	—	—	87,5 MHz	—	Confirme que la tensión de CC entre TP101 (VT OSC) y TP110 (GND) sea de 3,4 V $\pm$ 2,0 V.
2	—	—	108,0 MHz	—	Confirme que la tensión de CC entre TP101 (VT OSC) y TP110 (GND) sea de 8,7 V $\pm$ 2,0 V.
3 (*1)	IF BAND SW = NORMAL, CCTS SW = OFF				
	98,0	20 — 30	98,0 MHz	L302, T301, T302	Ajuste de forma que la tensión de CC entre TP104 (FM SM) y TP110 (GND) sea máxima.
4	IF BAND SW = NORMAL, CCTS SW = OFF				
	98,0	80	98,0 MHz	T501-(A)	Ajuste hasta que la tensión de CC entra TP106 (VREF) y TP1 07 (TM) sea de 0 V $\pm$ 100 mV.
				T501-(B) VR503	Ajuste hasta que la distorsión monoaural de salida sea mínima.
Repita los pasos 4— ① y 4— ② hasta que se cumplan ambos valores especificados.					
5	98,0	60	98,0 MHz	VR506	Ajuste hasta que la forma de onda de TP105 (SUB) esté al mínimo.
6	98,0	60	98,0 MHz	VR508	Ajuste hasta que el volumen de cancelación de la señal piloto de la salida sea máximo.
7	98,0	60 (Sin modulación)	98,0 MHz	VR507	Ajuste hasta que la frecuencia entre TP108 (VCO 38 kHz) y TP1 10 (GND) sea de 38 kHz $\pm$ 100 Hz. (*2)
8	Ajuste hasta que IF BAND SW = NORMAL, CCTS SW = OFF, T302 sea $\pm$ 90°.				
	98,0	80 (*3)	98,0 MHz	VR503, T302 (*4)	Ajuste hasta que la distorsión estéreo de la salida sea mínima.
9	98,0	60	98,0 MHz	VR501, VR502	Ajuste hasta que la separación de la salida esté al mínimo.
10	IF BAND SW = NORMAL, CCTS SW = OFF				
	98,0	90	98,0 MHz	VR505	Ajuste hasta que la tensión de CC entre TP104 (FM SM) y TP110 (GND) sea de 4,9 V $\pm$ 0,2 V.
11	IF BAND SW = NORMAL, CCTS SW = OFF				
	98,0	—	98,0 MHz	VR504	Ajuste hasta que haya silenciamiento cuando la salida sea de 15 dB $\pm$ 4 dB.

(\*1) Este ajuste es solamente para los tipos HE, HB, y KUC.

(\*2) Antes de realizar los ajustes, espere por lo menos un minuto después de poner en ON el interruptor POWER.

(\*3) Modulación estéreo: Principal 1 kHz, canales izquierdo + derecho  $\pm$  68,25 kHz, y piloto 19  $\pm$  6,75 kHz.

(\*4) T302 es solamente para los tipos HE, HB, y KUC. Si la distorsión estéreo no mejora en HEZ y HIX1B, ajuste la bobina IFT (Fig. 5-2) de la etapa de entrada a  $\pm$  90°.

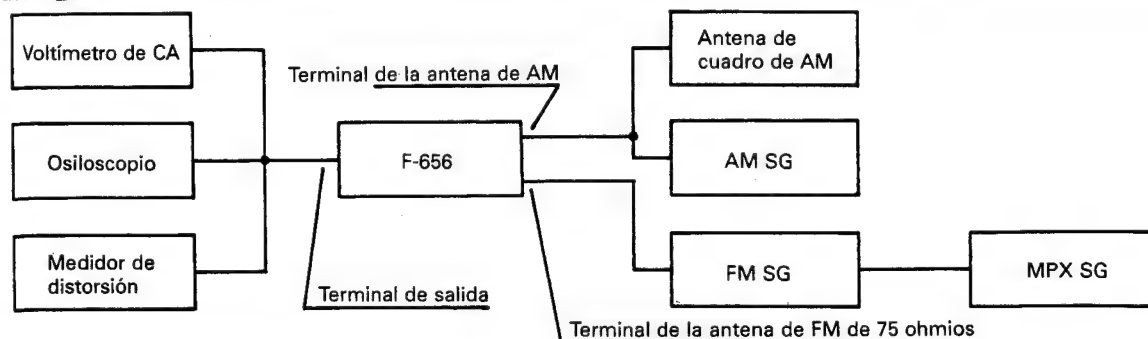


Fig. 5-1

## SECCIÓN DE AM

- Con respecto a las conexiones y puntos de ajuste, consulte la Fig. 5-1 y Fig. 5-2.
- Ponga el selector función en "AM".

No. de paso	AM SG (400 Hz, modulación al 30%)		Tipo F-656 (F-656-S) Visualización de la frecuencia de recepción	Ajuste	
	Frecuencia (kHz)	Nivel (dB $\mu$ )		Lugar de ajuste	Especificaciones
1	—	—	522 kHz (530 kHz)	TC201	Ajuste hasta que la tensión de CC entre TP101 (VTOSC) y TP110 (GND) sea de $1,25 \text{ V} \pm 0,2 \text{ V}$ .
2	—	—	1629 kHz (1700 kHz)	L202	Ajuste hasta que la tensión de CC entre TP101 (VTOSC) y TP110 (GND) sea de $10,0 \text{ V} \pm 0,3 \text{ V}$ .
3	Repita los pasos 1 y 2 hasta que cumplan ambos valores especificados.				
4	603 (600)	20 — 30	603 kHz (600 kHz)	T201	Ajuste hasta que la tensión de CC entre TP103 (AM SM) y TP110 (GND) sea máxima.
5	1395 (1400)	20 — 30	1395 kHz (1400 kHz)	TC202	Ajuste hasta que la tensión de CC entre TP103 (AM SM) y TP110 (GND) sea máxima.
6	Repita los pasos 4 y 5 hasta que se cumplan ambos valores especificados.				
7	999 (1000)	20 — 30	999 kHz (1000 kHz)	T202	Ajuste hasta que la tensión de CC entre TP103 (AM SM) y TP110 (GND) sea máxima.
8	CCTS SW = OFF				
	999 (1000)	100	999 kHz (1000 kHz)	VR201	Ajuste hasta que la tensión de CC entre TP103 (AM SM) y TP110 (GND) sea de $4,9 \text{ V} \pm 0,2 \text{ V}$ .

NOTA: Las secciones entre paréntesis indican la frecuencia con el tipo KUC (paso de 10 kHz).

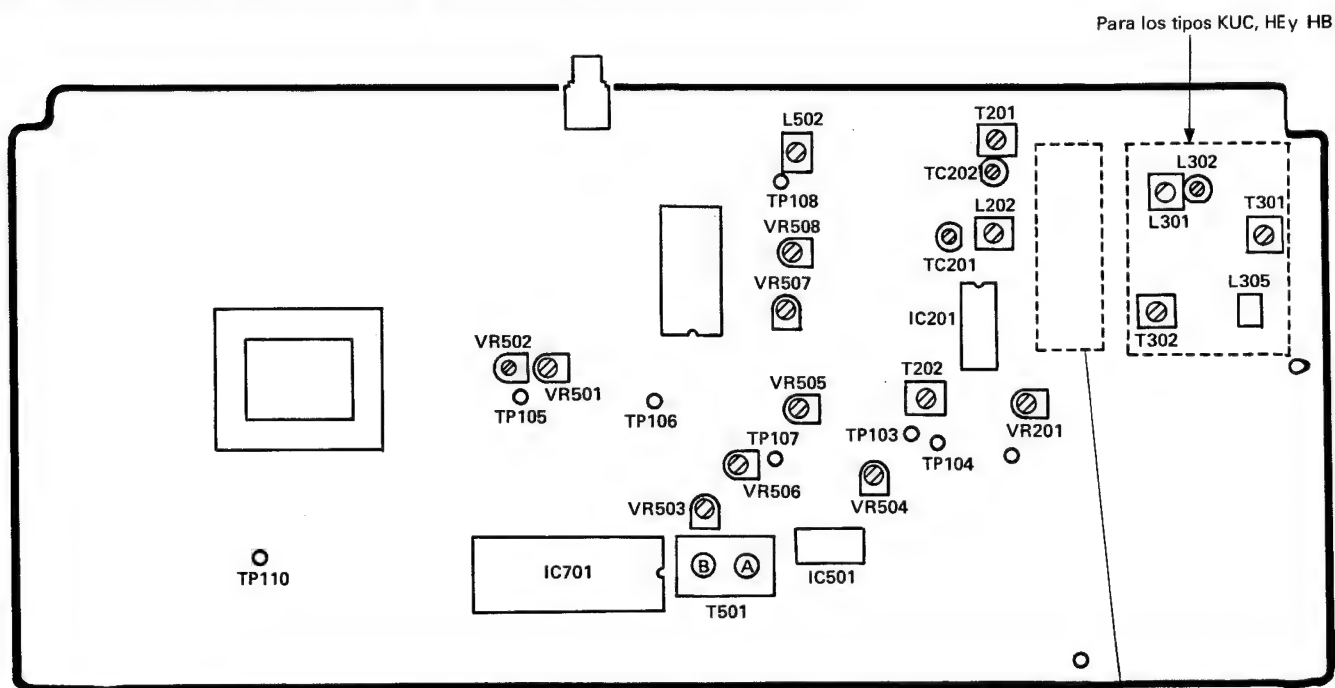
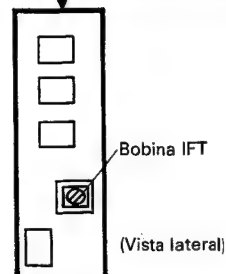


Fig. 5-2

Para los tipos HEZ y HIX1B



## 6. ELECTRICAL PARTS LIST

### NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 $\Omega$	$56 \times 10^1$	561.....	RD1/4PS $\Delta$ $\Delta$ $\Delta$ J
47k $\Omega$	$47 \times 10^3$	473.....	RD1/4PS $\Delta$ $\Delta$ $\Delta$ J
0.5 $\Omega$	0R5.....		RN2H $\Delta$ $\Delta$ $\Delta$ K
1 $\Omega$	010.....		RS1P $\Delta$ $\Delta$ $\Delta$ K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k $\Omega$	$562 \times 10^1$	5621.....	RN1/4SR $\Delta$ $\Delta$ $\Delta$ $\Delta$ F
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### Miscellaneous

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
	Tuner assembly	AWZ2416		D605, D613	S5566
	Display assembly			D202, D401 — D408, D501, D608,	1SS252
$\Delta$	Fuse (FU101) (500mA/125V)	AEK-136		D701 — D705	
$\Delta$	AC power cord	ADG-088		D201	1SV156
				D601 — D604	10DF2FD
				D301 — D303	1SV147
			TH501	Thermister (8.5k — 11.5k)	TH103-2

### Tuner Assembly (AWZ2416)

#### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC201	LA1247
	IC202	LM7001
	IC203	M5223P
	IC601	NJM79M09FA
	IC502	PA5007
	IC501	PA5008
	IC701	PD5107
	IC401, IC402	UPC1163H
	Q201, Q401, Q402, Q609, Q610, Q612	DTA143ES
	Q203, Q403, Q608, Q701 — Q703	DTC124ES
	Q611	2SA1515
	Q204, Q704	2SC1740S
	Q206	2SC1740SLN
	Q601 — Q604	2SC2878
	Q605, Q606	2SD880
	Q607, Q202 Q205, Q501, Q502	2SK246
	Q304	2SC2668
	Q302	2SC2786
	Q301, Q305, Q306	2SK241
	D610, D612	RD6.2ESB2
	D609	RD6.2ESB3
	D611	RD6.8ESB1
	D502	RD8.2FB
	D203, D204	SVC321C2

#### COILS, TRANSFORMERS AND FILTERS

Mark	Symbol & Description	Part No.
	L202	AM osc coil
	L502	38kHz coil
	L201	Axial inductor
	L203, L303, L304, L401 — L403,	LAU2R2M
	L501	Axial inductor
	L701	Axial inductor
	L301	FM coil
	L302	FM coil
	L305	FM coil
	T201	AM ANT. transformer
	T202	AM IF transformer
	T501	FM DET. transformer
	T601	Power transformer
	T301	FM RF transformer
	T302	FM matching transformer
	F401, F405, F406	FM ceramic filter
	F201	AM ceramic filter
	F402	Ceramic filter
	F403	Ceramic filter
	F404	Ceramic filter
	F501, F502	Low pass filter
		ATF1069

$\Delta$

## CAPACITORS

Mark	Symbol & Description	Part No.
	C210 (470p/50V)	ACE1039
	C524 (390p/50V)	ACG-023
	C502, C517, C519, C548 (0.047 $\mu$ /25V)	ACG-038
	C212, C308, C614 — C616, C701 — C703, C710 (100p/50V)	ACG1017
	C217, C228 (1000p/50V)	ACG1020
	C201, C203, C205 — C207, C213, C216, C219, C220, C224, C241, C303, C307, C310, C311, C316, C401, C403, C404, C407, C410, C414 (0.01 $\mu$ /50V)	ACG1021
	C208, C211, C214, C215, C218, C225, C229, C510, C512, C617, C618 (0.022 $\mu$ /50V)	ACG1022
	C708 (22000 $\mu$ /5.5V)	ACH1023
	TC201, TC202 Ceramic trimmer	ACM-019
	C209, C317	CCMCH070D50
	C237, C238, C312, C507	CCMCH150J50
	C313, C506	CCMCH330J50
	C620	CEANP220M50
	C602	CEANP470M50
	C240, C508, C509, C511	CEAS010M50
	C523	CEAS1R5M50
	C527, C528, C546, C604, C605, C704, C709	CEAS100M25
	C202, C204, C619	CEAS2R2M50
	C520, C529	CEAS220M25
	C603	CEAS221M35
	C515	CEAS3R3M50
	C221, C234, C243, C245, C249, C612	CEAS330M16
	C222, C223, C226	CEAS4R7M50
	C236, C247, C532, C606, C607, C706	CEAS470M10
	C525	CEAS6R8M50
	C503, C516	CEXA101M25
	C518	CEXA222M16
	C601	CEXA332M35
	C608	CEYA100M16
	C547	CEYA221M16
	C235, C402, C609, C613	CEYA330M16
	C537 — C540	CEYA4R7M50
	C227	CFTXA103J50
	C230, C239	CFTXA104J50
	C231	CFTXA153J50
	C242, C244	CFTXA224J50
	C232, C521	CFTXA473J50
	C233	CFTXA563J50
	C541	CFTXA333J50
	C246, C248, C405, C406, C408, C409, C411, C415 — C417, C610, C705, C707	CKDYF223Z50

Mark	Symbol & Description	Part No.
	C305	CCCRH330J50
	C309	CCDCH010C50
	C306	CCDCH020C50
	C302, C304	CCDRH330J50
	C301	CCDRH390J50
	C315	CCDTH180J50
	C314	CCMCH080D50
	C418, C501, C504, C505, C611	CKDYX473M25
	C513, C514	CKMYB181K50
	C530, C531	CQMXA222J100
	C621	CQMXA473J100
	C533, C534	CQPXA222J2A
	C535, C536, C542, C543	CQPXA332J2A
	C522	CQSA152J50
	C526	CQSA682J50

## RESISTORS

Mark	Symbol & Description	Part No.
	VR507 Semi-fixed (2.2k)	VRTS6VS222
	VR506 Semi-fixed (220)	ACP1021
	VR503 Semi-fixed (1k)	ACP1022
	VR501, VR502 Semi-fixed (4.7k)	ACP1024
	VR504 Semi-fixed (10k)	ACP1025
	VR508 Semi-fixed (22k)	ACP1026
	VR201 Semi-fixed (47k)	ACP1027
	VR505 Semi-fixed (100k)	ACP1028
	R623	RS1LMF152J
	R522	RN1/4PQ5601F
	R613 Fuseble	RFA1/4PS4R7J
	R611	RD1/2PMF101J
	R251, R610, R612, R614	RD1/2PM□□□J
	R228, R503, R504, R506, R524 — R541, R543	RDR1/4PM□□□J
	R622 (2.2M, 1/2W)	ACN-208
	R205, R215, R223 — R227, R221, R248, R507 R508, R512 — R520, R523, R602 — R605	RD1/4PM□□□J
	Other resistors	RD1/8PM□□□J

## OTHERS

Mark	Symbol & Description	Part No.
	X202 Crystal resonator (7.200MHz)	ASS1005
	X701 Ceramic resonator (4.19MHz)	ASS1018
	X201 Ceramic resonator (450kHz)	ATF-125
	Antenna terminal (with 1PF)	AKA1013
	2P pin jack	AKB1039
	Mini jack	AKN-207

Display Assembly  
SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC101, IC102	LC7570
	D105 LED	AEL1072
	D101 — D104	1SS252

## SWITCHES

Mark	Symbol & Description	Part No.
	S101 — S122 Tact switch (STATION CALL, FM, AM, CCTS, MEMO, TUNING-DOWN, TUNING- UP, POWER, IF BAND, MPX MODE, RF ATT)	ASG1029

## CAPACITOR

Mark	Symbol & Description	Part No.
	C101 (0.022 $\mu$ /50V)	ACG1022

## RESISTORS

Mark	Symbol & Description	Part No.
	R101, R102	RD1/4PM□□□J
	R103, R104	RD1/8M103J

## OTHER

Mark	Symbol & Description	Part No.
	V101 Fluorescent tube	AAV1077

# 7. FOR F-656/HE, HB, HEZ, HIX1B AND F-656-S/HEZ TYPES

## 7.1 CONTRAST OF MISCELLANEOUS PARTS

### NOTES:

- Parts without part number cannot be supplied.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "©" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The F-656/HE, HB, HEZ, HIX1B and F-656-S/HEZ types are the same as the F-656/KUC type with the exception of the following sections.

Mark	Symbol & Description	Part No.						Remarks
		F-656/KUC	F-656/HE	F-656/HB	F-656/HEZ	F-656/HIX1B	F-656-S/HEZ	
	FL filter	AAK1687	AAK1686	AAK1686	AAK1686	AAK1686	AAK1686	
	Acryl panel	AAK1717	AAK1685	AAK1685	AAK1685	AAK1685	AAK1685	
	Station call knob	AAD1549	AAD1549	AAD1549	AAD1549	AAD1549	AAD1551	
	Station call knob	AAD1550	AAD1550	AAD1550	AAD1550	AAD1550	AAD1552	
	Panel base	AMB1464	AMB1464	AMB1464	AMB1464	AMB1464	AMB1465	
	Front panel	ANB1275	ANB1275	ANB1275	ANB1275	ANB1275	ANB1276	
	Bonnet	AZN1745	AZN1745	AZN1745	AZN1745	ANE1140	AZN1803	
	Screw	BBT30P060FZK	BBT30P060FZK	BBT30P060FZK	BBT30P060FZK	BBT30P060FZK	ABA-274	
	Connection cord with mini plug	ADE-085	...	...	...	...	...	
	FM antenna assembly	ADH1007	ADH1002	ADH1002	ADH1002	ADH1002	ADH1002	
	Operating instructions (English)	ARB1168	...	ARB1168	...	...	...	
	Operating instructions (English/French/German/Italian/Dutch/Swedish/Spanish/Portuguese)	...	ARE1118	...	...	...	...	
	Operating instructions (German)	...	...	...	ARC1136	...	ARC1136	
	Operating instructions (Italian)	...	...	...	...	ARC1163	...	
	Front rear pad	AHA1095	AHA1095	AHA1095	AHA1095	AHA1200	AHA1095	
	Packing case	AHD1608	AHD1608	AHD1608	AHD1608	AHD1673	AHD1609	
$\Delta$	AC power cord	ADG-088	ADG1021	ADG-063	ADG1010	ADG1010	ADG1010	
$\Delta$	Fuse (500mA/125V, FU101)	AEK-136	...	...	...	...	...	
$\Delta$	Fuse (T315mA/250V, FU101)	...	AEK1033	AEK1033	AEK1033	AEK1033	AEK1033	
	Tuner assembly	AWZ2416	AWZ2415	AWZ2415	AWZ2414	AWZ2417	AWZ2414	
	Rear panel	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	
	Spacer C	...	Non supply	Non supply	Non supply	Non supply	Non supply	

• Tuner Assemblies (AWZ2414, AWZ2415 and AWZ2417)

The Tuner Assemblies (AWZ2414, AWZ2415 and AWZ2417 types) are the same as the Tuner Assembly (AWZ2416) with the exception of the following sections.

Note: For the schematic diagram and P.C. board patterns, refer to pages 7 — 16.

Mark	Symbol & Description	Part No.				Remarks
		AWZ2416 (KUC type)	AWZ2414 (HEZ type)	AWZ2415 (HE, HB types)	AWZ2417 (HIX1B type)	
	Q301, Q305, Q306	2SK241	...	2SK241	...	
	Q302	2SC2786	...	2SC2786	...	
	Q304	2SC2668	...	2SC2668	...	
	Q704	2SC1740S	...	...	...	
	D301 — D303	1SV147	...	1SV147	...	
	D202, D401 — D408, D501, D608, D701 — D704	1SS252	1SS252	1SS252	1N4531	
	D705	1SS252	...	...	...	
	L301	ATC1001	...	ATC1001	...	
	L302	ATC1002	...	ATC1002	...	
	L303, L304	LAU2R2M	...	LAU2R2M	...	
	L305	ATC1003	...	ATC1003	...	
	L503, L505	...	LAU101K	...	LAU101K	
	L504	...	LAU010M	...	LAU010M	
	T301	ATC-194	...	ATC-194	...	
	T302	ATE-063	...	ATE-063	...	
△	T601 (Power Transformer)	ATT1094	ATT1107	ATT1107	ATT1107	
	F402	ATF-119	ATF1066	ATF-119	ATF1066	
	C301	CCDRH390J50	...	CCDRH390J50	...	
	C302, C304	CCDRH330J50	...	CCDRH330J50	...	
	C305	CCCRH330J50	...	CCCRH330J50	...	
	C306	CCDCH020C50	...	CCDCH020C50	...	
	C303, C307, C310, C311, C316	ACG1021	...	ACG1021	...	
	C308	ACG1017	...	ACG1017	...	
	C309	CCDCH010C50	...	CCDCH010C50	...	
	C312	CCMCH150J50	...	CCMCH150J50	...	
	C313	CCMCH330J50	...	CCMCH330J50	...	
	C314	CCMCH080D50	...	CCMCH080D50	...	
	C315	CCDTH180J50	...	CCDTH180J50	...	
	C317	CCMCH070D50	...	CCMCH070D50	...	
	C530, C531	CQMXA222J100	CQMXA152J100	CQMXA152J100	CQMXA152J100	
	C541	CFTXA333J50	CFTXA683J50	CFTXA333J50	CFTXA683J50	
	C542, C543	CQPXA332J2A	CQPXA152J2A	CQPXA152J2A	CQPXA152J2A	
	C544	...	CKDYF103Z50	...	CKDYF103Z50	
	C710	ACG1017	...	...	...	
	R251	RD1/2PM103J	...	...	...	
	R301, R304	RD1/8PM473J	...	RD1/8PM473J	...	
	R302	RD1/8PM470J	...	RD1/8PM470J	...	
	R303, R307	RD1/8PM221J	...	RD1/8PM824J	...	
	R305	RD1/8PM824J	...	RD1/8PM824J	...	
	R306, R420	RD1/8PM101J	...	RD1/8PM101J	...	
	R308	RD1/8PM512J	...	RD1/8PM512J	...	
	R309	RD1/8PM123J	...	RD1/8PM123J	...	
	R310	RD1/8PM682J	...	RD1/8PM682J	...	
	R311, R312	RD1/8PM151J	...	RD1/8PM151J	...	

Mark	Symbol & Description	Part No.				Remarks
		AWZ2416 (KUC type)	AWZ2414 (HEZ type)	AWZ2415 (HE and HB types)	AWZ2417 (HIX1B type)	
△	R419	RD1/8PM471J	RD1/8PM102J	RD1/8PM471J	RD1/8PM102J	
	R536, R537	RDR1/4PM333J	RDR1/4PM273J	RDR1/4PM333J	RDR1/4PM273J	
	R538, R539	RDR1/4PM132J	RDR1/4PM561J	RDR1/4PM152J	RDR1/4PM561J	
	R540, R541	RDR1/4PM242J	RDR1/4PM332J	RDR1/4PM222J	RDR1/4PM332J	
	R622	ACN-208	...	...	...	
	R704	...	RD1/8PM223J	RD1/8PM223J	RD1/8PM223J	
	R708	RD1/8PM104J	...	...	...	
	R729	RD1/8PM154J	...	...	...	
	R730	RD1/8PM154J	...	...	...	
	R731	RD1/8PM102J	...	...	...	
	R732	RD1/8PM472J	.....	...	...	
	Terminal (ANT.PAL) (2P)	...	AKA1012	AKA1012	AKA1012	
	Terminal (ANT.F) (1P)	AKA1013	...	...	...	
	Jack (mini)	AKN-207	...	...	...	
	FM Front End	...	AXF1032	...	AXF1032	

• Display Assembly (HE, HB, HIX1B and HEZ types)

The Display Assembly (HE, HB, HIX1B and HEZ types) is the same as the Display Assembly (KUC type) with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		KUC type	HE, HB types	HIX1B type	HEZ type	
	D101 – D104	1SS252	1SS252	1SS252	1N4531	

## 8. IC INFORMATION

### 8.1 TUNER CONTROL MICROCOMPUTER PD5107

#### Functions of terminals.

No.	NAME	DESCRIPTION	ACTIVE	NO.	NAME	DESCRIPTION	ACTIVE
1	V <sub>CC</sub>	Power supply (5V).	—	33	P57	N. C.	—
2	AV <sub>SS</sub>	A/D, D/A GND (0V).	—	34	P56	KEY MATRIX INPUT	—
3	V <sub>REF</sub>	Reference voltage (5V).	—	35	P55		—
4	D/A	Added voltage for CCTS.	—	36	P54		—
5	PWM	N. C.	—	37	P53		—
6	P63	Forced mono.	H	38	P52		—
7	P62	MUTE	H	39	P51		—
8	P61	Hi-Blend	H	40	P50		—
9	P60	NARROW	L	41	P17	N. C.	—
10	P47	N. C.	—	42	P16	N. C.	—
11	AN6	0-VOLT MUTE (A/D)	—	43	P15	N. C.	—
12	AN5	AM S METER (A/D)	—	44	P14	N. C.	—
13	AN4	FM S METER (A/D)	—	45	P13	WIDE	L
14	P43	9k/10k input.	—	46	P12	AM +B	L
15	P42	Stereo information (L=Stereo).	—	47	P11	FL AC	L
16	P41	Japan/Ex input.	—	48	P10	FM +B	L
17	P40	N. C.	—	49	P07	POWER MUTE	H
18	P37	N. C.	—	50	P06	POWER	L
19	P36	N. C.	—	51	P05	TEST DATA	L
20	P35	N. C.	—	52	P04	N. C.	—
21	P34	N. C.	—	53	P03	KEY MATRIX OUTPUT (TACT)	—
22	P33	RF ATT	H	54	P02		—
23	INT <sub>2</sub>	Back-up interrupt (AC input)	—	55	P01		—
24	P30	Remote control data input.	L	56	P00		—
25	P31	POWER IND	—	57	P27	N. C.	—
26	INT <sub>1</sub>	N. C. (5V Pull UP)	—	58	P26	N. C.	—
27	CNV <sub>SS</sub>	GND	—	59	P25	FL blank.	H
28	RESET	Power supply ON reset.	L	60	P24	LC7570 (No. 2) enable.	—
29	X <sub>IN</sub>	Oscillation input (fo = 4MHz).	—	61	P23	LC7570 (No. 1) enable.	—
30	X <sub>OUT</sub>	Oscillation output.	—	62	P22	PLL enable.	—
31	φ	N. C.	—	63	P21	Data for transmission of serial data	—
32	V <sub>SS</sub>	GND	—	64	P20	Clock for transmission of serial data.	—

#### Power supply ON/OFF sequence.

##### <Power supply ON>

Rises under one of the two following conditions.

- (1) V<sub>CC</sub> = 5 V ± 10%. Returning to H upon maintaining RESET terminal in L for 2 μs or more.
- (2) When there has been 32 interrupts in INT<sub>2</sub>.

##### <Power supply OFF>

Back-up under the following conditions.

INT<sub>2</sub> = 60 ms or more and AC has not entered.

INT<sub>2</sub> becomes the interrupt mode only during back-up. It is normal input state at normal times and there is one-time polling to timer Q at 5 ms.



Main unit key	Remote control key	SR code	Function
IF BAND	None		With FM: Synchronizes Normal/Super Narrow switching display to switch. With AM: WIDE ON/OFF. Displays NORMAL during wide.  There is a mute for approx. 1 second during switching. Mode Memory is possible.
RF ATT	None.		Switches between RF ATT ON/OFF each time it is pressed. Display RF ATT when ON. Operates only during FM. Mode memory possible. There is a mute for approx. 1 second during switching.
POWER	POWER	A4 1C	Power supply goes ON or OFF each time this is pressed. LED lights when power supply in ON. If the Memory key and this key (main unit only and double push) are pressed down during the power ON. All FL displays will extinguish (operations are normal). If any key other than Power is pressed in this state, the FL displays will light for 5 seconds and then extinguish (operations of the pressed keys are normal). However, during UP/DOWN of frequency, the FL display is lit. The displays are extinguished after approx. 5 seconds of frequency UP/DOWN stops. POWER OFF releases this mode.
None	POWER ON	A4 1A	Turns power ON when power is OFF. No work when power is ON.
None	POWER OFF	A4 1B	Turns power OFF when power in ON. No work when power is OFF.
None	BAND	A4 13	Frequency band is changed each time this is pressed. FM — AM
None	MEMORY UP	A4 10	Calls one large ST from the ST No. in the present state. Continuous operation is possible. Call ST 1 when there is no ST No. Mute for approx. 1 second.
None	MEMORY DOWN	A4 11	Calls one small ST from the ST No. in the present state. Continuous operation is possible. Calls ST 24 when there is no ST No. Mute for approx. 1 second.

### Auto Stop

- Goes to Stop if it receives signals from a station that fulfills conditions of 2 or more signal meters lit during Auto mode.

### Test mode

The data below is loaded when P05 = L.

ST	9 k step	10 k step	ST	9 k step	10 k step
1	FM 87.50 M	FM 87.5 M	7	FM 108.00 M	FM 108.0 M
2	FM 89.00 M	FM 89.0 M	8	AM 531 k	AM 530 k
3	FM 90.00 M	FM 90.0 M	9	AM 603 k	AM 600 k
4	FM 99.00 M	FM 99.0 M	10	AM 1008 k	AM 1000 k
5	FM 106.00 M	FM 106.0 M	11	AM 1395 k	AM 1400 k
6	FM 107.00 M	FM 107.0 M	12	AM 1602 k	AM 1700 k

ST13 – 24

: 9k step AM 1602k  
: 10k step AM 1700k

IF Band is normal, MPX is Auto.

Key input, remote control input function table.

Main unit key	Remote control key	SR code	Function
ST 1	ST 1	A4 01	<p>When this is pressed once, ST1 to 12 are called individually (ST mode 1). If pressed again within two seconds, ST13 to 24 are called individually (ST mode 2). Each time it is pressed, the display changes back and forth between mode 1 and mode 2 ST. If the key is not pressed after that, it carries out CCTS operation (when CCTS is ON).</p> <p>The MUTE time is approx. 1 second when CCTS is OFF.</p>
ST 2	ST 2	A4 02	
ST 3	ST 3	A4 03	
ST 4	ST 4	A4 04	
ST 5	ST 5	A4 05	
ST 6	ST 6	A4 06	
ST 7	ST 7	A4 07	
ST 8	ST 8	A4 08	
ST 9	ST 9	A4 09	
ST 10	ST 10	A4 00	
ST 11	ST 11	A4 46	
ST 12	ST 12	A4 47	
CCTS	None		Changes the CCTS mode each time it is pressed. During operation CCTS blinks and the S meter is extinguished. Then MUTE is on for approx. 3 seconds. When the operation is finished, CCTS lights and Mode Memory is not possible.
MEMORY	None		When this is pressed once, the unit goes to memory mode. When it is pressed again, it is released. If it is pressed repeatedly following this the operation is repeated. If ST key is pressed when MEMORY blinks (for approx. 5 seconds.), it will wait approx. 2 seconds from that time and then store the present data in ST. The memory mode is released if any keys are pressed other than the ST key, IF Band, MPX or RF ATT.
FM	FM	A4 0D	Does not operate during selecting FM. Carries out FM last call CCTS operation (when CCTS is on). Mutes for approx. 1 second.
AM	AM	A4 0E	Does not operate during selecting AM. Carries out AM last call CCTS operation (when CCTS is on). Mutes for approx. 1 second.
UP	UP	A4 56	When this is pressed once, the frequency is moved a step up. If the key is held down, the unit goes to the auto tuning mode after approx. 0.5 seconds. If the key is then held down for approx. 2 seconds, the unit goes to high speed search. High speed search stops when you release your hand. Auto tuning stops when the key is pressed. Will then go to CCTS operation when it stops if CCTS is ON.
DOWN	DOWN	A4 57	The only difference is that frequency goes DOWN. The operation is the same as for UP.
MPX	MPX	A4 1E	It changes as follows each time it is pressed: Auto (Stereo)—Hi Blend—Mono to synchronize the display. During AUTO, a weak input Mute is operating. The Mute does not operate during switching. Mode Memory is possible. Only operates with FM.

## 8.2 FL INDICATOR DRIVER LC7570

### IC1 — LC7570

#### Functions of terminals

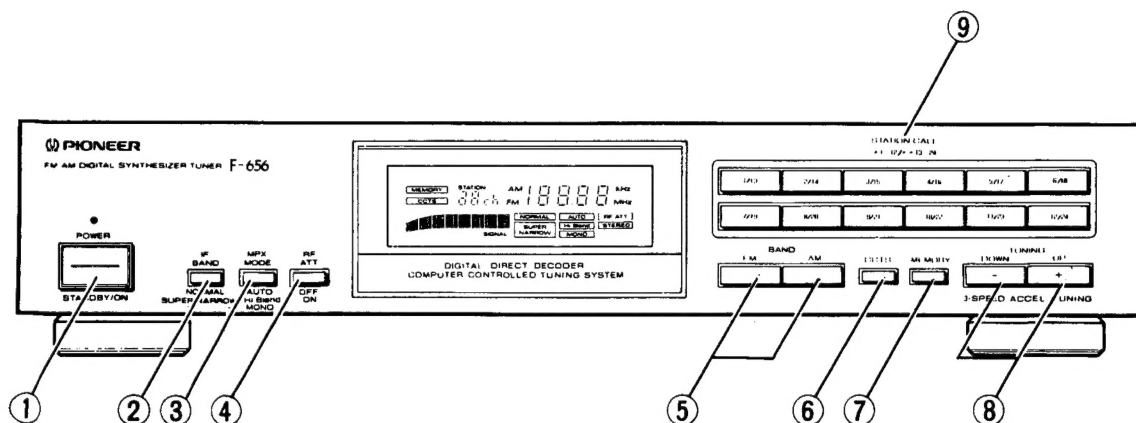
Pin-No.	Name	DESCRIPTION	Pin-No.	Name	DESCRIPTION
42	1a	CH 10 digit Seg. a.	25	4c	FRQ 10 digits, Seg. c
41	1b	CH 10 digit Seg. b.	24	4d	FRQ 10 digits, Seg. d
40	1c	CH 10 digit Seg. c.	23	4e	FRQ 10 digits, Seg. e
39	1d	CH 10 digit Seg. d.	22	4f	FRQ 10 digits, Seg. f
38	1e	CH 10 digit Seg. e.	21	S11	NORMAL
37	1g	CH 10 digit Seg. g.	20	S7	RF ATT
36	2a	CH 1 digit Seg. a.	19	B8	S meter display (MSB).
35	2b	CH 1 digit Seg. b.	18	B7	S meter display (7).
34	2c	CH 1 digit Seg. c.	17	B6	S meter display (6).
33	2d	CH 1 digit Seg. d.	16	B5	S meter display (5).
32	2e	CH 1 digit Seg. e.	15	B4	S meter display (4).
31	2f	CH 1 digit Seg. f.	14	B3	S meter display (3).
30	2g	CH 1 digit Seg. g.	13	B2	S meter display (2).
29	3b	FRQ 100 digits, Seg. b.	12	B1	S meter display (LSB).
28	3c	FRQ 100 digits, Seg. c.	11	S3	STATION ch
27	4a	FRQ 10 digits, Seg. a.	10	S2	CCTS
26	4b	FRQ 10 digits, Seg. b.	9	S1	MEMORY

### IC2 — LC7570

#### Functions of terminals

Pin-No.	Name	DESCRIPTION	Pin-No.	Name	DESCRIPTION
42	4g	FRQ 10 digits, Seg. g.	25	6f	FRQ 0.1 digits, Seg. f.
41	5a	FRQ 1 digits, Seg. a.	24	6g	FRQ 0.1 digits, Seg. g.
40	5b	FRQ 1 digits, Seg. b.	23	7a	FRQ 0.01 digits, Seg. a.
39	5c	FRQ 1 digits, Seg. c.	22	7b	FRQ 0.01 digits, Seg. b.
38	5d	FRQ 1 digits, Seg. d.	21	7c	FRQ 0.01 digits, Seg. c.
37	5e	FRQ 1 digits, Seg. e.	20	7d	FRQ 0.01 digits, Seg. d.
36	5f	FRQ 1 digits, Seg. f.	19	7e	FRQ 0.01 digits, Seg. e.
35	5g	FRQ 1 digits, Seg. g.	18	7f	FRQ 0.01 digits, Seg. f.
34	DP	FRQ COMMON	17	7g	FRQ 0.01 digits, Seg. g.
33	—	N. C.	16	B0	SIGNAL .....
32	—	N. C.	15	S5	FM MHz
31	—	N. C.	14	S4	AM kHz
30	6a	FRQ 0.1 digits, Seg. a.	13	S16	Hi Blend
29	6b	FRQ 0.1 digits, Seg. b.	12	S13	STEREO
28	6c	FRQ 0.1 digits, Seg. c.	11	S15	MONO
27	6d	FRQ 0.1 digits, Seg. d.	10	S12	AUTO
26	6e	FRQ 0.1 digits, Seg. e.	9	S14	SUPER NARROW

## 9. PANEL FACILITIES



### ① POWER (STANDBY/ON) switch/Indicator

Press to turn power on or off.  
When the power is on, indicator lights.

- When this switch is set to the on position, power is supplied to the tuner's main circuits. The POWER unit's switch is geared to selecting the transformer's secondary so that even in **STANDBY** position, the unit's circuitry will work as long as the power cord is connected to a power outlet.

#### NOTE:

- The memory will be backed up so long as the power cord is not unplugged.
- If the power cord is unplugged, the memory will be retained for several days.

### ② IF BAND button

Each time this button is pressed the bandwidth of the IF circuit switches between "normal" and "super narrow" for the FM band and "wide" and "normal" for the AM band.

The selected bandwidth is displayed as follows:

In the **FM** band the **NORMAL** or **SUPER NARROW** indicator lights up. In the **AM** band the **NORMAL** indicator lights up or none of the two for "wide".

Set to **SUPER NARROW** in FM or **NORMAL** in AM band in case of interference from other stations.

#### NOTE:

The setting of this button is memorized together with the station in the station memory.

### ③ MPX (multiplex) MODE button

Mode changes as follows each time this button is pressed:



This button does not affect AM reception.

#### AUTO:

Depending on the broadcast station, **STEREO** or **MONO** is automatically selected.

**AUTO** indicator lights up.

#### NOTE:

When the signal level is too weak for reception, sound output is automatically muted.

#### Hi Blend:

Select this position when the stereo signal is noisy.

High frequencies will be blended, improving sound quality.

**Hi Blend** indicator lights up.

#### MONO:

To receive stereo broadcasts in monaural.

**MONO** indicator lights up.

#### NOTE:

The setting of this button is memorized together with the station in the station memory.

**④ RF ATT button**

Set this switch to ON when receiving strong FM signals (nearly stations) to reduce sound distortion (RF ATT indicator lights). Normally, this switch should be set to OFF.

**NOTE:**

The setting of this button is memorized together with the station in the station memory.

**⑤ BAND selector buttons****FM:**

Press to receive FM broadcasts.

**AM:**

Press to receive AM broadcast.

**⑥ CCTS button****(Computer controlled tuning system)**

When this button is set to ON, the unit's built-in microcomputer automatically performs the optimum tuning for the station received. (Initially, the CCTS indicator will flash and light continuously when tuning is optimum.)

**⑦ MEMORY button**

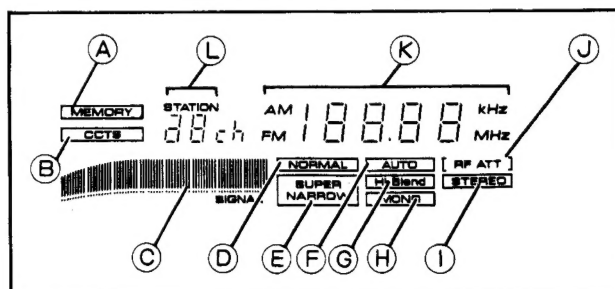
Press to memorize preset stations. The **MEMORY** indicator will remain lit for several seconds. Press the desired **STATION CALL** buttons to memorize it during this period.

**MEMORY****⑧ TUNING UP/DOWN buttons**

Use these buttons to tune in broadcasting stations. Press UP (+) to receive a station whose frequency is higher than the displayed frequency, and DOWN (−) to tune in to a lower frequency station.

**⑨ STATION CALL buttons**

Use these buttons to preset stations and to receive already preset stations.

**OPERATING DISPLAY****Ⓐ MEMORY indicator**

Lights for a few seconds when the MEMORY button is pressed.

**Ⓑ CCTS indicator**

This indicator flashing when the CCTS is operating.

**Ⓒ SIGNAL indicator****Ⓓ NORMAL indicator**

Stays lit while the IF BAND button is set to NORMAL.

**Ⓔ SUPER NARROW indicator**

Stays lit while the IF BAND button is set to SUPER NARROW.

**Ⓕ AUTO indicator**

Stays lit while the MPX MODE button is set to AUTO.

**Ⓖ Hi Blend indicator**

Stays lit while the MPX MODE button is set to Hi Blend.

**Ⓖ MONO indicator**

Stays lit while the MPX MODE button is set to MONO.

**Ⓛ STEREO indicator**

Lights up when a stereo broadcast is received. (The indicator does not light when the MPX MODE button is set to MONO.)

**Ⓜ RF ATT indicator**

Stays lit while the RF ATT button is on.

**Ⓚ Frequency indicator**

Shows reception band and frequency.

**Ⓛ STATION indicator**

When a STATION CALL buttons are pressed, it will show the corresponding channel number.

## 10. SPECIFICATIONS

### FM Tuner Section

Frequency range	87.5 MHz to 108 MHz
Usable Sensitivity	
NORMAL	Mono: 12.1 dBf, IHF (1.1 $\mu$ V/75 $\Omega$ )
50 dB Quieting Sensitivity	
NORMAL	Mono: 15.9 dBf, IHF (1.7 $\mu$ V/75 $\Omega$ )
	Stereo: 36.2 dBf, IHF (17.7 $\mu$ V/75 $\Omega$ )
Sensitivity (DIN)	
NORMAL	Mono: 0.75 $\mu$ V/75 $\Omega$
	Stereo: 28 $\mu$ V/75 $\Omega$
Signal-to-Noise Ratio	Mono: 85 dB (at 80 dBf)
	Stereo: 80 dB (at 80 dBf)
Signal-to-Noise Ratio (DIN)	Mono: 72 dB
	Stereo: 65 dB
Distortion (at 80 dBf)	
NORMAL	Mono: 0.06% (100 Hz)
	0.06% (1 kHz)
	0.1% (6 kHz)
	Stereo: 0.1% (100 Hz)
	0.1% (1 kHz)
	0.15% (10 kHz)
SUPER NARROW	Mono: 0.15% (1 kHz)
	Stereo: 0.5% (1 kHz)
Capture Ratio	
NORMAL	1.0 dB
Alternate Channel Selectivity	
NORMAL	80 dB (400 kHz)
Stereo Separation	60 dB (1 kHz)
	50 dB (20 Hz to 10 kHz)
Frequency Response	+ 0.4 dB (20 Hz to 15 kHz)
	- 1.0
Image Response Ratio	50 dB
IF Response Ratio	90 dB
AM Suppression Ratio	60 dB
Spurious Response Ratio	70 dB
Subcarrier Product Ratio	55 dB
Muting Threshold	25.2 dBf (5 $\mu$ V/75 $\Omega$ )
Antenna Input	75 $\Omega$ unbalanced

### AM Tuner Section

Frequency range	530 kHz to 1700 kHz (Step 10 kHz)
	531 kHz to 1602 kHz (Step 9 kHz)
Sensitivity (IHF, Loop antenna)	150 $\mu$ V/m
Selectivity	40 dB
Signal-to Noise Ratio	50 dB
Image Response Ratio	40 dB
IF Response Ratio	60 dB
Antenna	Loop Antenna

### Audio Section

Output (Level/Impedance)	
FM (100% MOD) FIXED	650 mV/0.9 k $\Omega$
AM (30% MOD) FIXED	150 mV/0.9 k $\Omega$

### Miscellaneous

Power Requirements	
U.K. model	a.c. 240 Volts $\sim$ , 50/60 Hz
U.S., Canadian models	a.c. 120V, 60 Hz
Other models	a.c. 220 Volts $\sim$ , 50/60 Hz
Power Consumption	
U.K. model	10W
U.S., Canadian models	11W
Other models	10W
Dimensions	420 (W) $\times$ 86 (H) $\times$ 316 (D) mm
	16-1/2 (W) $\times$ 3-3/8 (H) $\times$ 12-7/16 (D) in
Weight (without package)	3.4 kg (7 lb 8 oz)

### Furnished Parts

FM T-type Antenna	1
AM Loop Antenna	1
Connecting Cord with Pin Plugs	1
Operating Instructions	1
Control cord with mini pin plugs (U.S., Canadian models only)	1

#### NOTE:

*Specifications and design subject to possible modification without notice, due to improvements.*

### MAINTENANCE OF EXTERNAL SURFACES

- Use a polishing cloth or dry cloth to wipe off dust and dirt.
- When the surfaces are very dirty, wipe with a soft cloth dipped in some neutral cleanser diluted five or six times with water and wrung out well, then wipe again with a dry cloth. Do not use furniture wax or cleaners.
- Never use thinners, benzene, insecticide sprays and other chemicals on or near this unit, since these will corrode the surfaces.

### POWER-CORD CAUTION

Handle the power cord by the plug. Do not pull out the plug by tugging the cord and never touch the power cord when your hands are wet as this could cause a short circuit or electric shock. Do not place the unit, a piece of furniture, etc., on the power cord, or pinch the cord. Never make a knot in the cord or tie it with other cords. The power cords should be routed such that they are not likely to be stepped on. A damaged power cord can cause fire or give you an electrical shock. Check the power cord once in a while. When you find it damaged, ask your nearest PIONEER authorized service center or your dealer for a replacement.